The RUBBER AGE

February, 1945

TECHNOLOGY DEPT.

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R·T VANDERBILT CO·INC·
AMERICAN PRODUCTS

CUMATE

"Some Are Not Afraid to use it"–

•

Alone or along with Altax, CUMATE is the *Speed King* of Vulcanization for GR-S –yet is not Scorchy.

•

SPEED · SAFETY · AVAILABILITY

See our Laboratory Report Booklet No. 4, June 1, 1944

R. T. VANDERBILT CO., Inc.
230 Park Avenue, New York 17, N. Y.

R·T VANDERBILT CO·INC·
AMERICAN PRODUCTS

Newsletter No. 2
FEBRUARY, 1945

Published by Rubber Chemicals Division of DU PONT

MORE RPA No. 5 AVAILABLE FOR EFFICIENT BREAKDOWN OF GR-S

SINCE the introduction of RPA No. 5 late in 1943, the demand has exceeded the supply. With the recent completion of new and improved manufacturing facilities substantially increased quantities are now available—a good assurance that the rubber industry can get all the RPA No. 5 needed for manufacture and evaluation.

Experience during the past year with RPA No. 5 as a plasticizer for GR-S confirms that it aids materially in reducing breakdown time, thus increasing processing capacity. Since more efficient processing of GR-S is what the rubber industry needs to overcome the increased production burden brought about by continuing high demand for war products, RPA No. 5 can be of great help to the industry.

RPA No. 5 is a chemical peptizing agent which is added to GR-S during mastication. Some of the desirable effects are:

1. Leveling out of lot to lot variations in GR-S.
2. Reduction in breakdown time.
3. Smoother processing.
4. Less heat developed.
5. Broader temperature range of good processing.
6. Lower minimum processing temperature.
7. Better extrusion properties.
8. Faster extrusion.
9. Less swell of extruded stock.
10. No effect on hardness or other properties of cured stock.

IMPROVED EQUIPMENT EFFICIENCY—The immediate practical advantage of plasticizing GR-S with RPA No. 5 is the greatly increased breakdown capacity. In one case plasticator capacity was increased by 83%, and Banbury breakdown capacity 100%.

The effect of RPA No. 5 continues through subsequent operations so that the slightly tougher GR-S from one pass through the plasticator with RPA No. 5 gives as soft, finished stocks as the 2-pass GR-S without RPA No. 5. Lower power consumption and stock temperatures are evident throughout. With the lower temperatures better quality stocks should result.

AMOUNT OF RPA No. 5 TO USE—The proper amount of RPA No. 5 to use depends on such factors as (1) the type of masticating equipment employed, (2) the properties of the particular GR-S in question and (3) the end results desired. For most purposes we suggest the use of the amounts indicated below:

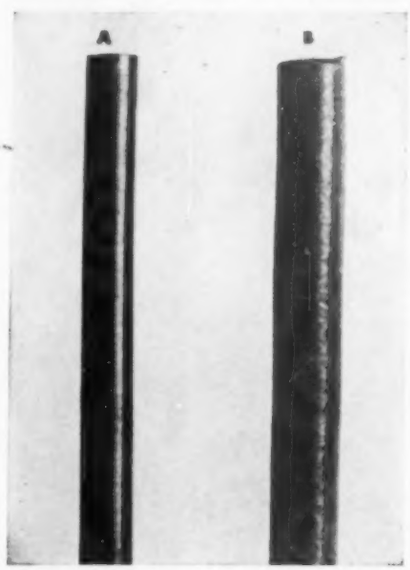
Masticating Equipment	% RPA No. 5 on GR-S
Mill	1.00—2%
Banbury	0.50—2%
Gordon Plasticator .	0.25—1%

EFFECT ON CURE—Experimental data are inconclusive as to the effect of higher quantities of RPA No. 5 on the rate of cure of GR-S stocks. There are indications that stocks accelerated with Thionex, MBT, MBTS or DPG are slightly retarded by 2% of RPA No. 5. With activated accelerators such as SRA No. 2, Zenite B, MBT-DPG and 2MT-Accelerator 808, the vulcanizates have slightly lower modulus, equal tensile strength and higher elongations at break. With 0.5% of RPA No. 5 there is essentially no effect on the physical properties of the cured stock.

HEALTH HAZARDS—Although experience to date indicates that it is much less likely to cause dermatitis than either RPA No. 2 or RPA No. 3, which are widely used in the industry, nevertheless we recommend following the same precautions as with the other RPA's. Workmen should wear long sleeved shirts and gauntlet gloves, and should wash thoroughly any parts of the body exposed to RPA No. 5.

EXTRUSION OF GR-S TREAD STOCK

GR-S Masticated for 20 Minutes at 250° F. 500 Grams Elastomer—8x16 in. Mill



	A	B
Peptizing Agent .	1% RPA No. 5 Liquid	None
Temperature of Extrusion . . .	Low	High
Speed of Extrusion	High	Low
Swell on Extrusion	7%	55%

DU PONT
RUBBER CHEMICALS DIVISION
BETTER THINGS FOR BETTER LIVING . . . Through Chemistry

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FREE

A New, Interesting Informative Booklet about Hycar

Reg. U. S. Pat. Off.

SYNTHETIC RUBBERS

THERE is no limit to the use of resilient rubber parts having the right combination of the properties listed in the box at the right. That's why you'll want a copy of "Everywhere in Industry". It's a new, easy-to-read, generously illustrated 16-page booklet containing information that's new . . . up-to-the-minute! It covers the many important developments in Hycar synthetic rubbers that have been made in the last 3 years.

The booklet describes Hycar's characteristics in detail, provides technical data that will be helpful in suggesting new applications for this material. "Everywhere in Industry" will help you in your present and future plans.

Because of its many desirable properties, the potential uses of Hycar throughout industry are so broad it is impossible to know all the ways in which it may be advantageously used. As new applications occur to you, and you need help developing them, please call on our Technical Service Staff. And . . .

for your FREE copy of

"Everywhere in Industry"

write Department S-1, Hycar Chemical Company, Akron 8, Ohio.

Check These Superior Features of Hycar

1. **EXTREME OIL RESISTANCE**—insuring dimensional stability of parts.
2. **HIGH TEMPERATURE RESISTANCE**—up to 250° F. dry heat; up to 300° F. hot oil.
3. **ABRASION RESISTANCE**—50% greater than natural rubber.
4. **MINIMUM COLD FLOW**—even at elevated temperatures.
5. **LOW TEMPERATURE FLEXIBILITY**—down to —65° F.
6. **LIGHT WEIGHT**—15% to 25% lighter than many other synthetic rubbers.
7. **AGE RESISTANCE**—exceptionally resistant to checking or cracking from oxidation.
8. **HARDNESS RANGE**—compounds can be varied from extremely soft to bone hard.
9. **NON-ADHERENT TO METAL**—compounds will not adhere to metals even after prolonged contact under pressure. (Metal adhesions can be readily obtained when desired.)

Hycar

Reg. U. S. Pat. Off.

LARGEST PRIVATE PRODUCER OF BUTADIENE TYPE

Synthetic Rubbers

PHILBLACK A

A New and Improved HMF Type Black for Synthetic and Natural Rubbers

PHILBLACK A is new and different in that the superior properties it imparts to vulcanizates cannot be duplicated by other common type blacks.

High Abrasion Resistance
Low Heat Build-Up
Easy Processing

A substantial background of experience in the use of Philblack A in a wide range of actual applications has verified these outstanding qualities.

Have you entered the Chicago Rubber Group Contest?

PHILLIPS PETROLEUM COMPANY

Philblack Division, First Central Tower, Akron, Ohio

With Geon it's the *combination* of properties that counts

THE processor who coated this lightweight fabric with GEON really "made something of it". For with the application of one of the GEON polyvinyl raw materials he created a fabric possessing many unusual and desirable properties in a *combination* that was *planned* to meet specific needs.

This same type of planning is possible for fabricators in the rubber industry just as it is in textiles, packaging, shoes, upholstery and many others. For more than 30 distinct properties may be had in an almost unlimited number of *combinations*. For example, products made of GEON may be made to resist water, heat, cold, aging, wear, abrasion, sunlight, chemicals and many other destructive factors. They can be made tasteless, odorless, non-toxic. They may be brilliantly—or softly—colored.

This coated fabric is just one example of what can be done with the GEONS. For in addition to serving as a coating for fabric or paper, the GEONS can be calendered or cast into sheet or film. They can be extruded, pressure or injection molded. Products made of GEON may be flexible or rigid. Doesn't all this suggest some new—or old—product that *you* want to make out of GEON?

Right now all the GEONS are subject to allocation by the War Production Board. Limited quantities can be had for experiment. For more complete information write Department KK-2, Chemical Division, The B. F. Goodrich Company, 324 Rose Building, Cleveland 15, Ohio.

Geon
Polyvinyl Materials

CHEMICAL DIVISION
The B. F. Goodrich Company
324 ROSE BUILDING • CLEVELAND 15, OHIO

THE experienced workman in the picture is one of the "facilities" that Philadelphia Rubber will have "available" for you as soon as the war ends and you resume the making of rubber products for normal peacetime consumption. He's typical of the *experience* that can be found throughout the Philadelphia Rubber organization.

Some of this experience is new—and has been translated into *new* knowledge of reclaim compounds. For example, Philadelphia Rubber's accelerated research with GR-S has established several important facts that will mean lower cost of your finished postwar products. That, in turn, will improve your sales position in the competitive market that is sure to return.

But back of all this new knowledge is the accumulation of years of experience with reclaimed rubber. There is no organization in this country better equipped to help you with problems involving the use of reclaim. Let this skilled, experienced workman represent our sincere invitation to you to make use of our laboratory staff and facilities in solving any reclaim problems that you may have now or in the future. The Philadelphia Rubber Works Company, 324 Rose Building, Cleveland 15, Ohio.

PHILADELPHIA
RECLAIMED RUBBER

In your plant . . .

NAFTEX for SPEED, CLEANLINESS, EASE OF HANDLING

REG. U. S. PAT. OFFICE

NAFTEX is a unique material—a combination of carbon black and sulfur-reactive plasticizer in the form of free-flowing clean pellets. It is backed by two years of intensive development-aimed at solving some of your most difficult factory handling and processing problems. NAFTEX is a proven product used in large-scale factory production. If you are using SRF or HMF carbon black, NAFTEX can help you.

WHAT NAFTEX WILL DO FOR YOU

1. It will make your factory cleaner. *NAFTEX reduces carbon black dust.*

2. It will increase your mill capacity. *NAFTEX appreciably reduces time of incorporation.*

3. It will eliminate the handling of plasticizers of the viscous-liquid type. *NAFTEX is a dry free-flowing product in pellet form.*

4. It will eliminate the storage, handling, and return of steel drums. *NAFTEX comes in multi-wall paper bags.*

5. It will improve your labor relations. *NAFTEX is liked by the man in the factory.*

THREE TYPES OF NAFTEX ARE NOW AVAILABLE:

NAFTEX SRF 67—⅔ SRF Carbon Black and ⅓ Sulfur-Reactive Plasticizer.

NAFTEX SRF 75—¾ SRF Carbon Black and ¼ Sulfur-Reactive Plasticizer.

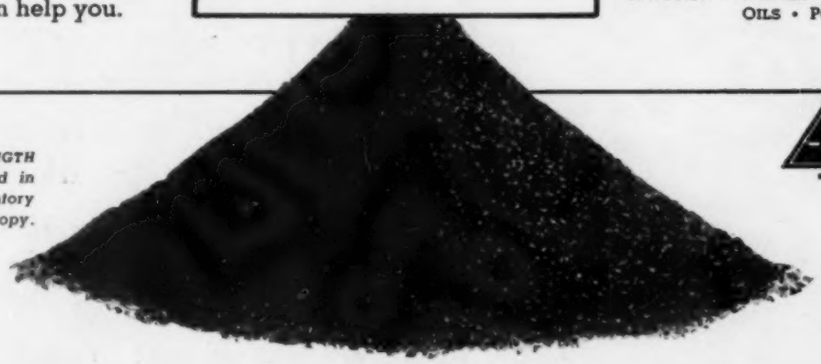
NAFTEX HMF 67—⅔ HMF Carbon Black, ⅓ Sulfur-Reactive Plasticizer.

Write for samples.

• • •

WILCHEM PRODUCTS: NAFTOLEN • NAFTEX MULTI-PLAST • ECONO-PLAST • NAFTOLEN EMULSION • WILMEX • WILCOR RECLAIMING OILS • POLY-TINT

The booklet, "TENSILE STRENGTH TABLE," designed as an aid in your physical testing laboratory is available. Write for your copy.



W-C=C

REG. U. S. PAT. OFFICE

WILMINGTON

CHEMICAL CORPORATION

10 EAST 40TH STREET • NEW YORK 16, N. Y.

Do You Know...

- How to insert liner with stocks?
- The best way to separate stock and liner?
- Why liner leaders are important?
- How to prevent lint and ravelings?
- About the use of liners with substitutes?
- How to preserve the stock's tackiness?
- When and where to use interleaving paper?

This Booklet
CONTAINS THE ANSWERS
(AND MANY MORE)!

Illustrated with diagrams, this booklet contains a complete account of the many advantages gained by using Climco Processed Liners. It also contains many valuable hints on the proper care and use of liners, information based upon our 23 years of specialization in liner processing. Every production man in the industry should have a copy of this valuable booklet. Your copy will be sent promptly upon request.

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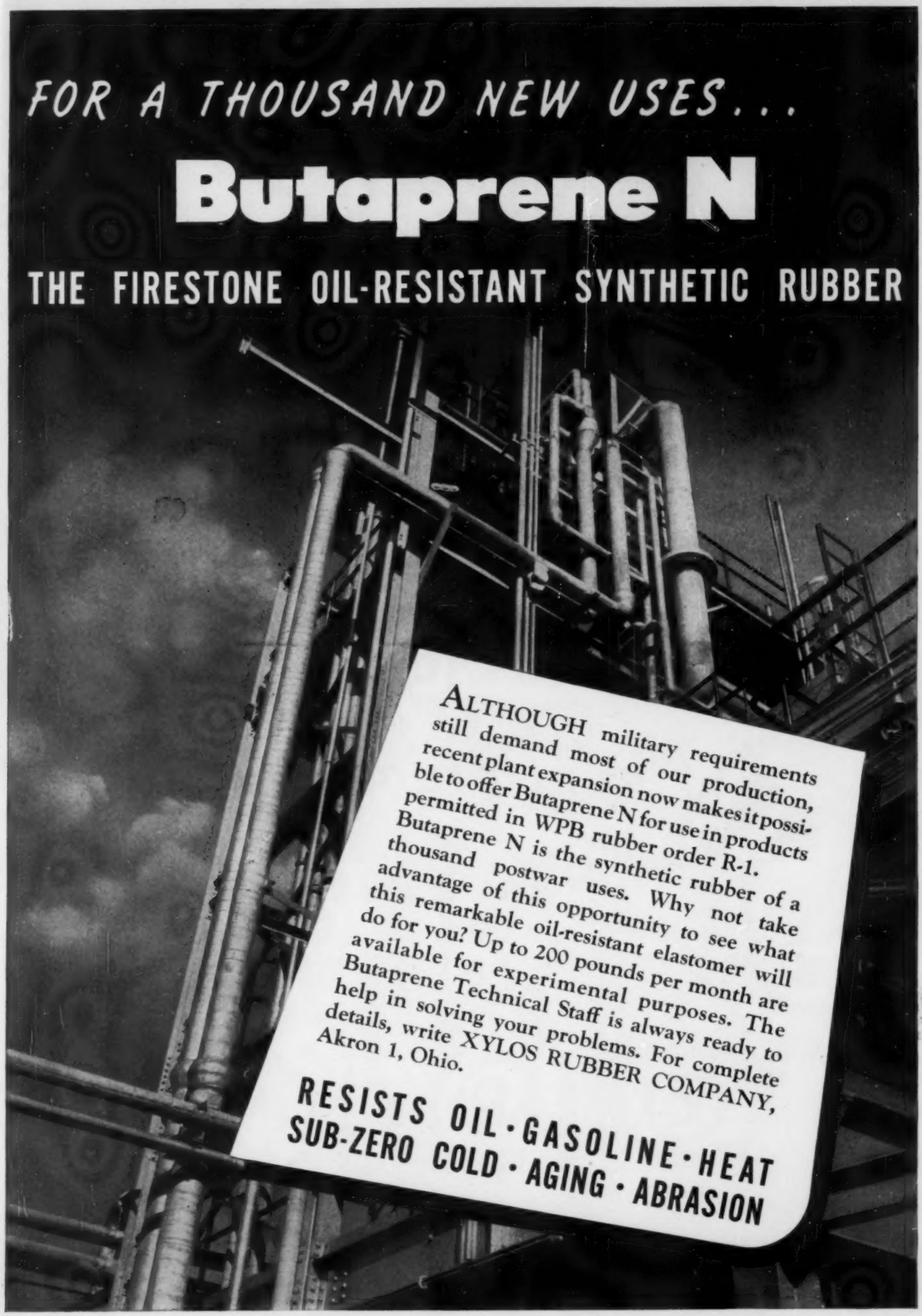
Treatment Contains
NO OIL OR WAX
Samples on Request

CLIMCO PROCESSED LINERS
for Faster, Better Production at Lower Cost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ALTHOUGH military requirements still demand most of our production, recent plant expansion now makes it possible to offer Butaprene N for use in products permitted in WPB rubber order R-1. Butaprene N is the synthetic rubber of a thousand postwar uses. Why not take advantage of this opportunity to see what this remarkable oil-resistant elastomer will do for you? Up to 200 pounds per month are available for experimental purposes. The Butaprene Technical Staff is always ready to help in solving your problems. For complete details, write XYLOS RUBBER COMPANY, Akron 1, Ohio.
RESISTS OIL · GASOLINE · HEAT
SUB-ZERO COLD · AGING · ABRASION

DIELEX

In GR-S

Produces

–Smooth Processing

–Firmer Uncured Stocks

–High Hardness

–High Modulus

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516 Ohio Bldg., AKRON, OHIO

KOSMOBILE 77 • DIXIEDENSED

CHANNEL CARBON BLACKS

KOSMOBILE 77 · DIXIEDENSED 77

These finely divided high grade channel blacks guarantee cool mixing, easy processing and low heat buildup.

Every pound controlled, which insures maximum reinforcement and stamina for all rubbers.

Our Technical Service Division is ready at all times to assist you in your compounding problems.

UNITED CARBON COMPANY, INC.

Charleston, West Virginia

New York · Akron · Chicago

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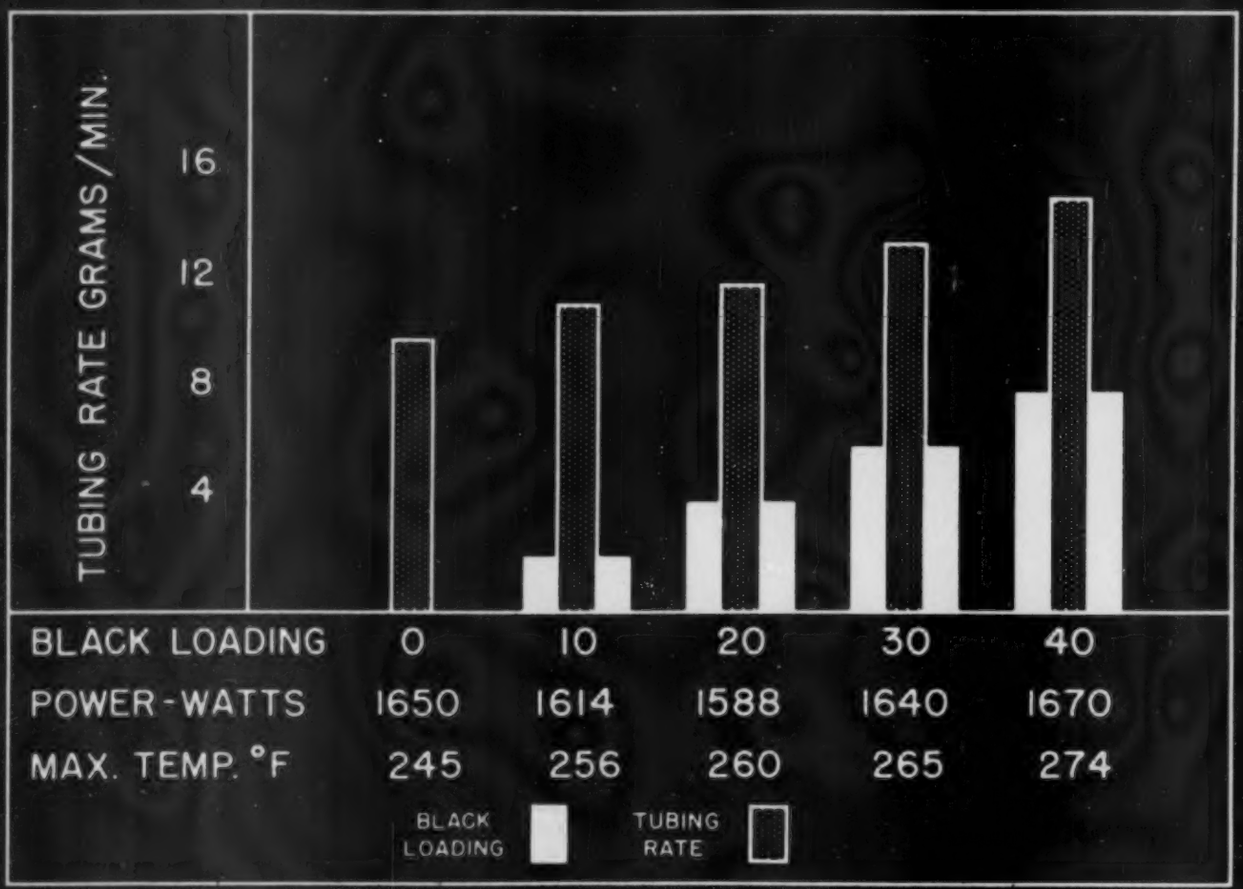
EFFECT OF DIXIEDENSED 77 KOSMOBILE 77 CHANNEL CARBON BLACK ON THE BREAKDOWN OF GR-S



DIXIEDENSED 77 – KOSMOBILE 77

Start with Dixiedensed 77—Kosmobile 77 as an aid in the breakdown and mastication of GR-S and thus save on milling time. Then use more of this finely divided high grade channel process black to provide the necessary reinforcement and stamina.

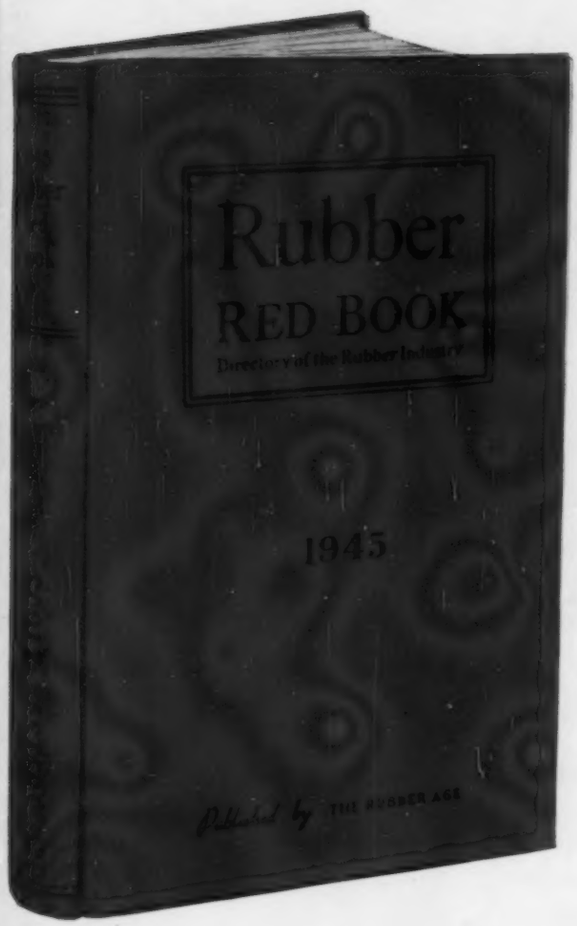
Dixiedensed 77—Kosmobile 77—the cool mixing, easy processing, high reinforcing and low heat generating black, outstanding for uniform quality and fine performance.

RESEARCH DIVISION

UNITED CARBON COMPANY, INC.

Charleston, West Virginia

Plan Now for Space in the 1945 RUBBER RED BOOK!



The Fifth Issue of the RUBBER RED BOOK —the 1945 Edition—is scheduled for publication this summer.

This edition will be completely revised and enlarged, and will reflect the many changes in plants, products, materials and personnel which have taken place in the rubber industry during the past two years.

Already many former advertisers, without waiting for any announcement, have ordered space in the new edition. Hundreds of requests have also been received from users who are anxious to get copies of the 1945 issue.

All of this advance interest indicates that the 1945 issue will be in greater demand than any previous edition and accordingly our print order will be increased to take care of the needs of the industry.

In a few short years the RUBBER RED BOOK has become the indispensable buyer's guide for the whole industry. Hundreds of letters testify to the fact that rubber plant purchasing agents, chemists, engineers, as well as Government procurement agencies and laboratories, use this book as their primary source of buying information. As a result, suppliers have found that the use of space in the RUBBER RED BOOK is an effective means of calling their products to the attention of these key men —and at a low cost, too!

Space Limited This Year

Advertising space in the 1945 edition will be limited due to the necessity of staying within our paper quota. Therefore we urge all suppliers contemplating the use of space in this edition to send in their reservations early for no advertising will be sold after the limit of the available space is reached.

Rate cards and order forms are being mailed to all suppliers. If you do not receive a copy, write for one today. In the meantime, brief rate data is included in the accompanying box to assist you in determining your needs.

Send in your order early!

1945 EDITION
Cost of Space

1 page	$100.	2 pages	$190.
½ page	55.	2 half pages	106.
¼ page	30.	2 ¼ pages	58.

Colors — Red ..... extra, 30.
Other Colors ..... extra, 40.
Special Positions, page ..... 115.
Bleed Pages, ... extra, 20%
Inserts — Not Accepted

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GENERAL CHEMICAL COMPANY

FOR AMERICAN INDUSTRY

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Potassium Cyanide—Sodium Cyanide: In production of acrylonitrile rubbers.

Copper Fluoborate—Zinc Fluoborate—Copper Cyanide—Sodium Cyanide: Intermediates for "plating" rubber to metals.

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WHEN you see this trade mark on a product, it is a positive guarantee of unvarying quality, superior performance, and absolute dependability. More than that, it stands for the helpful engineering cooperation, the careful study of customer's problems, and the constant progress in developing new improvements, that is an inherent policy of each of National-Standard's four divisions.

Although you, in the Rubber Industry may be familiar with one or two of the Divisions of National-Standard, the trade marks shown here will help identify the others that may be able to serve you with their particular products, experience, and helpful interest.

NATIONAL-STANDARD COMPANY
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Wire Braids flat and tubular in Steel or other metal. Tapes and Specialized Wire Products for Tire Beads, Steam Hose Armor, Reinforcement for Oil Well Drilling Hose. Braided Covering for Flexible Tubing, Aircraft and Tank Radio Shielding. Stranded Wire for reinforcing Flat and V Belts. Braided Covering for Electrical Cables. Drawn wire in small sizes down to .002, Steel, Aluminum, Brass, Monel, Nickel Silver, Stainless Steel, Phosphor Bronze and other Alloys.

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High quality Wire in small diameter sizes, down to .006. Round, Flat, Square, Special Shapes, Low and High Carbon Steel. Annealed, Hard Drawn, Tempered, Bright, Liquor Finish, Tinned, Copper Coated, Cadmium Coated, Galvanized.

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Cold Rolled, High Carbon Flat Steels in widths of 1/16" to 6 1/2", Thickness .0015 to .062 Custom-made Steels—.60 Carbon and higher. Entire range of Annealed, Hard Rolled, Black Tempered, Tempered and Polished or Tempered and Polished with Blue or Straw Colored finish, Best quality Small Flat Springs.

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Complete lines of automatic equipment—designed, manufactured and installed for can companies and others using sheets in the metal decorating trade. Individual units consist of Roller Coating Machines, Conveyor Type Ovens and Auxiliary Equipment for tandem operation with lithographing presses, etc.

BUY AND KEEP WAR BONDS AND STAMPS

PRODUCTION REPORT: *Plasticizing*

Machine Size: 20" Gordon Plasticator
Head Opening: 5/16"

Type of Rubber	Pounds per Hour 1st Pass	2nd Pass
Smoked Sheet	8,600	9,600
GRS	11,500	9,000

These are the actual production figures of a standard 20" Gordon Plasticator breaking down or plasticizing rubber in a large tire plant. They show that this one machine will do the work of seven or more 84" mills, depending upon the degree of plasticity required. The consequent savings in labor, power and operating costs can be easily imagined.

For plants which do not require such a high rate of production, two smaller size Plasticators are available — the 15" with a capacity of 4400 to 5000 lbs. per hour, and the 12" that has an output of 2400 to 2700 lbs. Compared with the required number of roll mills for an equivalent output, both of these sizes will show savings in cost as well as improved plasticity. There is also a 3" size for laboratory use.

Farrel-Birmingham engineers will be glad to supply full information on any or all of these sizes. Write today . . . no obligation.

FARREL-BIRMINGHAM COMPANY, INC., ANSONIA, CONN.

Plants: Ansonia and Derby, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Pittsburgh, Akron, Los Angeles

F-B PRODUCTION UNITS

- Banbury Mixers
- Plasticators
- Pelletizers
- Mixing, Grinding, Warming and Sheeting Mills
- Bale Cutters
- Tubing Machines
- Refiners
- Crackers
- Washers
- Calenders
- Hose Machines
- Hydraulic Presses and other rubber working equipment.

Farrel-Birmingham

Technical Bulletin No. 8 — on the Compounding of GR-S with Substantial Loadings of Zinc Oxide

Butyraldehyde Aniline—MBT Acceleration

IN THIS CASE the primary accelerator is of the basic type, activated with a small amount of acidic MBT. This compound produces moderate tensiles which hold well on aging, with good retention of elongation and little inclination toward "marching modulus." While the Pendulum Rebound is lower than some of the compounds previously reported, the Temperature Rise on flexing is very satisfactory.

COMPOUND NO. 8

GR-S	100.0
Sulfur	3.5
Butyraldehyde Aniline	1.0
MBT	0.15
ELC Magnesia	5.0
Coumarone-indene resin	7.5
Zinc Oxide	100.0

ORIGINAL RESULTS

Time of Cure Min. at 45 Lb.	Tensile Strength Lb./Sq. In.	Per Cent Elongation	Load (Lb./Sq. In.) For Elongation of					Permanent Set
			100%	200%	300%	400%	500%	
7.5	1270	770	—	120	200	275	435	.33
15	1160	595	—	200	320	480	760	.25
30	1090	505	—	240	360	605	1050	.21
45	1020	475	—	245	365	655	—	.17
60	1130	450	—	240	445	725	—	.17
90	960	430	—	280	480	840	—	.12
AFTER 24-HOURS GEER OVEN AGING AT 100° C.								
7.5	1030	585	125	250	330	455	700	.29
15	1250	520	160	285	405	645	1130	.31
30	1135	445	210	335	460	840	—	.25
45	1080	440	210	330	455	875	—	.22
60	1070	430	205	330	495	905	—	.19
90	1070	400	250	370	620	1070	—	.17

ORIGINAL RESULTS

Time of Cure Min. at 45 Lb.	Shore Hardness	Goodyear-Healey Pendulum		Compression Fatigue (Goodrich Flexometer)*					Cut-Growth Resistance Inches—Failure at	
		Indentation in mm.	Per Cent Rebound	Per Cent Initial Comp.	Running Time and Per Cent Permanent Set	Max. Temp. Rise °C.	Dynamic Compression		9,000 Cyc.	20,000 Cyc.
							Initial	Final		
45	47	8.06	58.6	21.6	15′—6.4	16.2	13.6	17.3	.23	.40
60	50	7.96	59.6	19.8	15′—4.5	14.9	11.8	14.0	—	—

*Test Conditions: 100 Lb. Load. 0.15″ Stroke. 100°C. Oven Temp.

***Uniform Quality* HORSE HEAD ZINC OXIDES**

New Jersey Zinc

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160 FRONT STREET • NEW YORK 7, N. Y.

Products Distributed by THE NEW JERSEY ZINC SALES COMPANY

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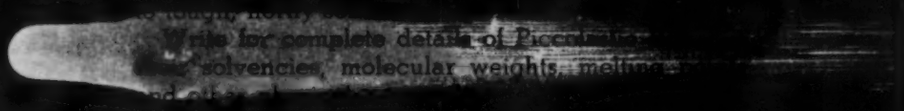
PICCOLASTIC

★ More than a score of grades, each having definite controlled characteristics

★ Applied with or without Solvents

★ Based on Styrene, substituted Styrenes and Homologues

★ Supported on paper, wood, leather, cloth, foil, transparent wrappings



Write for complete details of Piccolastic solvencies, molecular weights, melting

★ PENNSYLVANIA INDUSTRIAL CHEMICAL CORPORATION

SYNTHETIC RUBBER & RESIN COMPOUNDS

Custombuilt

FOR THE ARMED FORCES

A Partial List of War Products fabricated from GENERAL LATEX compounds.

- Synthetic Raincoats, Ponchos, and Clothing Bags — U. S. Army
- Camouflage Ponchos and Parka Suits — U. S. Navy
- Life Saving Suits — U. S. Coast Guard
- Bomber Runway Carpets — U. S. Army Air Corps
- Woven Glass Tubes for insulation of aircraft fuel and oil lines
- Fireproof Adhesives for securing insulating bats inside the hulls of boats — U. S. Navy
- Pontons — U. S. Army
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GRS latex types, 2, 3 and X-160, normal and concentrated, available from stock

General Latex & CHEMICAL CORP.

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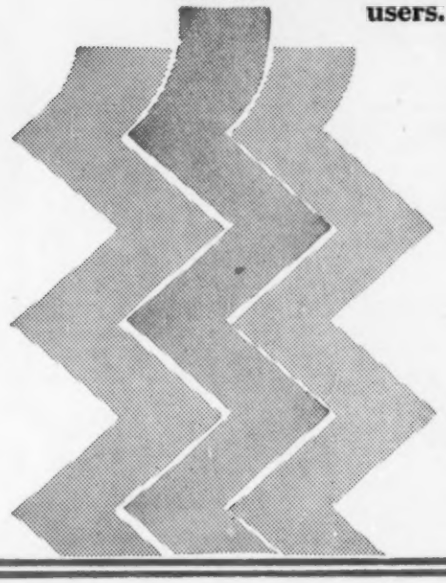
Agents for Rubber Reserve Company for storage and distribution of natural rubber latex. Distributors for Rubber Reserve Company for synthetic latex. Operators of the Government-owned Baytown, Texas, synthetic rubber plant in collaboration with the General Tire & Rubber Co.

Triumph . . .

Improvement is always a triumphant reward . . . First came triumph in the development of PICCOVOL, for it was an *improved* type of coal tar softener. Now comes *triumph* in the improved results it is giving to the products of many users.



PICCOVOL was first developed to meet the contract specifications of Rubber Reserve Company. Physically it does this, but in comprehensive tests conducted with many formulations of synthetic and reclaimed rubber it has revealed outstanding qualities that give it claim to greater consideration . . . PICCOVOL has improved the quality of a growing list of products to this extent: It has increased tear resistance, provided higher tensile, improved elongation and aging qualities. Write for bulletin giving laboratory test data.

PICCOVOL

Manufactured by
Pennsylvania Industrial Chemical Corp.

STANDARD *Chemical Company*
General Offices: AKRON 8, OHIO

LOEWENTHAL
AND
RUBBER

syn-on'y-mous (-mŭs), *a.* [Gr. συνώνυμος; σύν with, together + ὄνομα, ὄνυμα, name. See SYN-; NAME.] Having the character of a synonym; expressing the same, or nearly the same, idea. — *Webster.*

SINCE 1868—Loewenthal and Rubber have been practically synonymous—to think of one, in the rubber industry, is to think of the other.

And since the inception of the rubber reclaiming industry we have served the leading reclaimers with scrap—expertly sorted and classified to meet specifications. We have the "know how" based on long experience.

OUR FACILITIES ARE AT YOUR SERVICE

THE LOEWENTHAL CO.

JACK SIDER, *President* I. K. McELLIGOTT, *Exec. Vice-Pres.*

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Plasticizer and Extender for GR—S

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BARRETT RUBBER COMPOUNDING MATERIALS FOR SYNTHETIC, NATURAL AND RECLAIM STOCKS

Barrett Rubber Compounding Materials are the result of many years of continuing research and successful manufacturing experience. These hydrocarbons and oils are useful in processing every type of rubber and impart the wide variety of desirable characteristics suggested in the following chart.

RUBBER COMPOUNDING MATERIALS				
	Specific Gravity 25°C./25°C.	Softening Point. Ring and Ball in Glycerine	Insoluble in Benzene	
Carbonex* Flakes	1.28 to 1.38	205 to 220°F.	40.0 to 44.0	Carbonex is valuable for its properties of improving processing and extruding, especially in all reclaim and synthetic rubber compounds. Products compounded with Carbonex are tear and abrasion resistant. Reduces "nerve" and shrinkage in GR-S stocks, has good resistance to the action of acids, alkalis, oils, greases. Used in mechanical, footwear and extruded compounds.
Carbonex S Flakes	1.28 to 1.38	205 to 220°F.	40.0 to 44.0	A form of Carbonex modified with 5% of fatty acid, it differs from Carbonex in its greater ease of milling into plantation, reclaimed or synthetic rubbers. May be dispersed in all reclaim rubber compounds in a Banbury mixer.
Carbonex S Plastic	1.26 to 1.36	175 to 185°F.	38.0 to 43.0	May be dispersed in all-reclaim rubber compounds on open mills.
Bardol*	A dark colored coal-tar oil with high content of aromatic hydro-carbons. Characterized by a sp. gr. of 1.07-1.12, low viscosity at 40°F. Minimum distillation to 355°C. is 60%.			A wetting and dispersing agent for carbon black and clay and a softener for synthetic rubbers. Dispersing action promotes high abrasion and wear resistance, high strength and modulus.
Bardol B	A clear yellow product of coal-tar oil. Sp. gr. 1.00 to 1.04. Distils between 230-310°C.			Exhibits effective swelling and wetting action on rubber and fillers. A softener for synthetic rubbers, inner tube stocks, rubberized fabric and sundries. Non-staining.
S.R.O.*	A tar oil product liquid at 40°F. Sp. gr. 1.04 to 1.09, viscosity lower than B.R.V.			Penetrating qualities of S.R.O. make it desirable in reclaiming operations. It imparts good plasticity.
Dispersing Oil No. 10	A clear yellow-red product of coal-tar oil distilling approx. 210-320°C. Sp. gr. 1.00 to 1.05.			A reclaiming product with good dispersing and plasticizing properties. Also a good softener for synthetic rubbers.
B.R.H.* No. 2	A viscous fluid asphaltic product. It has a sp. gr. of approx 1.0; min. flash point of 400°F. and a max. evaporation loss of 1% in 5 hours on heating 50 grams at 163°C.			A rubber tackifier to improve calendering, flowing and molding properties. Used in reclaiming operations, adhesives and adhesive tapes and many other operations where a non-drying softener is desired.

	B.R.T. No. 3	B.R.T. No. 4	B.R.T. No. 7	
B.R.T.* No. 3) B.R.T. No. 4) B.R.T. No. 7)				The B.R.T. series offers refined coal-tar softeners with different viscosities, distillation ranges and carbon disulfide insoluble contents. Choice depends on the requirements of the particular problem. These materials have a dual function in that they serve as both softener and extender.
Specific Gravity 25°C./25°C.	1.15 to 1.20	1.15 to 1.20	1.20 to 1.25	
Specific Viscosity, Engler				
50 ml at 40°C	13 to 18			
50 ml at 50°C		15 to 30		
50 ml at 100°C			6 to 9	
Insoluble in Carbon Disulphide, % by weight	4 to 10	4 to 10	15 to 20	
Water, % by volume maximum	3.0	3.0	0.1	
Distillation, % by weight				
Maximum to 170°C	5	2	1	
Maximum to 270°C	25	20	13	
Maximum to 300°C	35	30	25	
Softening Point, Ring and Ball Distillation Residue at 300°C				
Degrees Centigrade	30 to 60	35 to 65	35 to 65	
B.R.V.*	A dark coal-tar oil of high-boiling range and a sp. gr. of 1.14 to 1.18. Distils not more than 28% at 355°C.			In rubber reclaiming operations based on its ready dissolving action on rubber. Imparts good tensile and aging properties in rubber, also a good softener in synthetic rubbers.
Reclaiming Oil No. 1621	A clear oil distillate with a sp. gr. of 0.89 to 0.94. Distillation range 150-220°C. Min. flash point 100°F.			In rubber reclaiming in both the digestor and pan methods.
Bardex*	A viscous fluid compounded from coal-tar products. Sp. gr. is 1.07 to 1.12. Benzene insoluble 1% max.			In rubber reclaiming in both digestor and pan methods and in general rubber compounding.
B.R.C.* No. 20	Solid coal-tar hydrocarbon. 15-25% insoluble in CS_2; sp. gr. 1.25 to 1.32. Softening point [illegible]			[illegible]tural and synthetic rubber compounds to promote [illegible]cking characteristics in[illegible]and

Reprinted from the current listing of Barrett Chemicals in Chemical Engineering Catalog.

If you would like a complete listing and reference manual on coal-tar chemicals, write for our new free booklet—"Barrett Chemicals for Industry."

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK 6, N. Y.

Barrett

RUBBER CHEMICALS

Check your requirements against these product listings

FOR MANUFACTURING ✓

ACRYLONITRILE — For Buna N type rubbers such as Hycar, Chemigum, Butaprene and Perbunan.

ACRYLIC MONOMERS — Methyl and ethyl acrylate, methyl, ethyl and butyl methacrylate for special-purpose rubbers or elastomer copolymers.

TRITON R-100—An efficient, low cost dispersing agent manufactured by Rohm & Haas. Recommended for latex compounding of GR-S.

PARAPLEX X-100—A new type elastomer developed by The Resinous Products & Chemical Company. Its oil resistance, excellent resilience, lack of sulphur and volatile plasticizers, and fast cure make it particularly useful in specialty compounds.

FOR PROCESSING ✓

TRITONS — Wetting agents are particularly useful in the latex field. Available in anion-active, cation-active, and non-ionic types.

ACRYSOL GS — Sodium salt of polyacrylic acid used in thickening latices or other dispersions.

Plasticizers and Modifiers

MONOMERIC or ELASTICATOR TYPES

DIBUTYL SEBACATE
DICAPRYL PHTHALATE
DIOCTYL and DIBENZYL SEBACATES
PLASTICIZERS 35 and 36

POLYMERIC or RESINOUS TYPES

PARAPLEX G-25
PARAPLEX AL-III

FOR FINISHING ✓

PARAPLEX RG-2—Particularly useful as a plasticizer for cellulose resins required for lacquers used to top-coat rubberized articles.

THE AMBEROLS—Used in the manufacture of varnishes for footwear and other rubber articles.

ACRYSOLS C-9 AND ER—These acrylic resin dispersions are useful for base-coats and adhesive work.

THE ACRYLOIDS—The more flexible of these acrylic resin solutions are also used for basecoat work and for improved adhesion to rubber. Non-tacky grades are useful in the manufacture of permanent glossy finishes for rubber articles.

8 awards to The Resinous Products & Chemical Company and its associated firms, Rohm & Haas Company and Charles Lennig & Co.

THE RUBBER CHEMICALS DEPARTMENT

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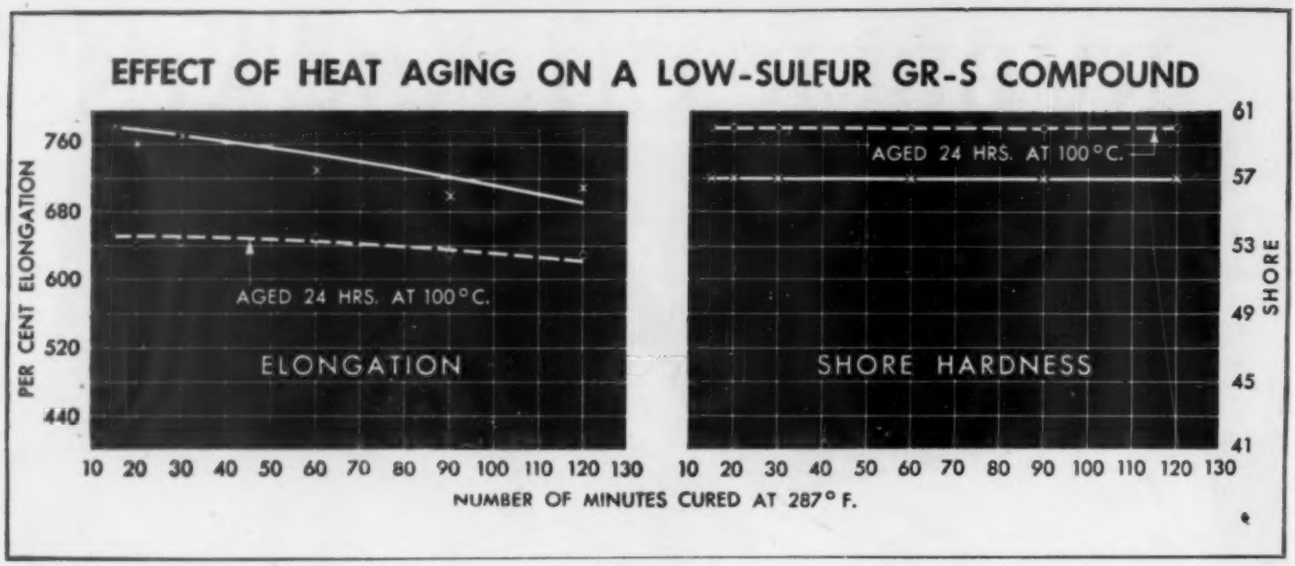
Washington Square, Philadelphia 5, Pa.

THE RESINOUS PRODUCTS & CHEMICAL COMPANY
Washington Square, Philadelphia 5, Pa.



Physical Properties of GR-S Compounds Stay Put with New Low-Sulfur Formula

Heat resistance now made practical by

F.B.S LITHARGE

High retention of physical properties... how important is that to you?

Your GR-S can have it, merely by changing to a low sulfur formula.

Now such a compound can be cured in a practical time and without extra quantities of accelerator.

F.B.S. Litharge plus benzothiazyl disulfide is what produces safe, fast cures with low sulfur content.

The curing period can be varied from 15 to 120 minutes with scarcely any effect on elongation, hardness or modulus.

Moreover, the effect of aging on samples cured for various periods is almost uniform.

Reference to the accompanying tables and charts should be convincing.

• • •

Ask us to send you a printed report, "Compounding of GR-S for Heat Resistance," issued by the Rubber Division of our Research Laboratories, which covers the subject of F.B.S. Litharge for low sulfur formulas in greater detail and from a number of additional angles. Write to

NATIONAL LEAD COMPANY

Rubber Division: 105 York Street, Brooklyn, N. Y.

New York, Buffalo, Chicago, Cincinnati, Cleveland, St. Louis, San Francisco; Boston (National-Boston Lead Co.); Pittsburgh (National Lead & Oil Co. of Penna.); Philadelphia (John T. Lewis & Bros. Co.).

FORMULA

GR-S (Institute)	100
E.P.C. Carbon Black	40
Sulfur	0.75
Zinc Oxide	3.0
Benzothiazyl Disulfide	1.0
F.B.S. Litharge	1.5
Coaltar softener	5

Data:

Time 287° F.	*Tensile Strength*	*% Elong.*	*Modulus 300% Elong.*	*Shore Hardness*
15	2890	780	640	57
20	3010	760	660	57
30	3090	770	660	57
60	2960	730	660	57
90	2850	700	685	57
120	2960	710	700	57
Aged 24 Hours at 100°C				
15	2970	660	980	60
20	3030	640	1020	60
30	2980	645	1000	60
60	3260	650	1040	60
90	3060	630	1130	60
120	2930	630	1040	60

OUTSTANDING CHARACTERISTICS:

The F.B.S. Litharge-thiazole combination used with low sulfur is characterized by the following:

1. Heat stability • **2.** Fast curing rate • **3.** High flat modulus **4.** Excellent general physical properties • **5.** Processing safety **6.** Efficiency • **7.** Economy.

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A Complete Line of Approved Compounding Materials

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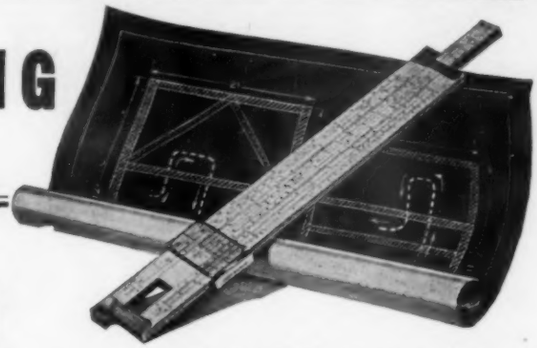
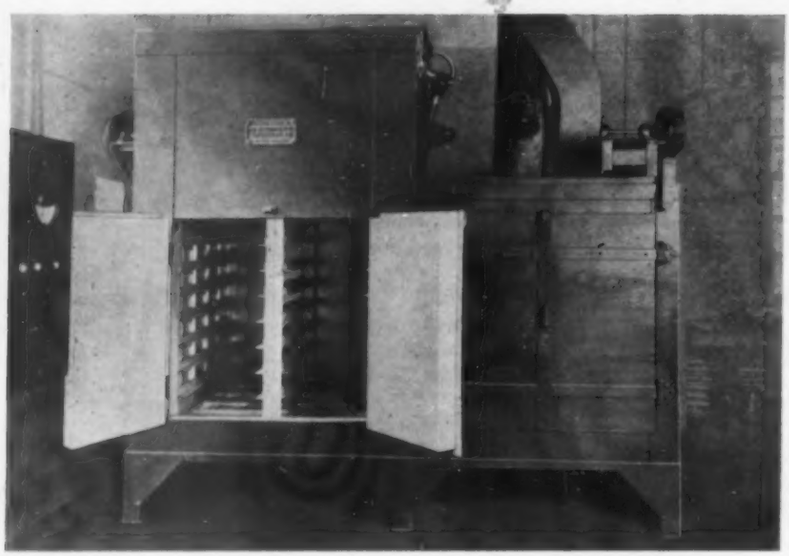
OVEN ENGINEERING NEWS



IOE Box Ovens Speed Work, Cut Cost and Reduce Hazard In Evaporation of Solvents



New conceptions of speed, economy, simplicity and safety in the evaporation and drying of inflammable and explosive materials are being brought to industry by installations of the Industrial Oven Engineering Company. Good examples are the two box ovens shown on this page, engineered specifically for their respective jobs but built along standard **IOE** designs.

The one above is used by the Cleveland Container Company to dry fabricated paper parts which have been dipped in a finishing solution consisting of approximately 50 per cent alcohol and 50 per cent solid matter. This oven has cut the drying time from 25 minutes to 5 minutes, at the same time relieving brittleness and increasing hardness of the finish, and effecting a substantial reduction in drying costs. One of the features responsible for the production step-up is the auxiliary pre-heating zone which utilizes exhaust air from the oven proper.

Despite the fact that the oven is direct gas fired, constituting a seeming hazard in the evaporation of large volumes of alcohol, it is perfectly safe and has insurance company approval. Whether the problem is the evaporation or drying of alcohol, acetone, naphthas, methyl-ethyl-ketone, or any other highly volatile solvent, the same safe operation can be expected. This type of system can be used also for drying, finishing, heat treating or any other heat processing where materials can be handled in trays, jigs or baskets. It is especially adapted for dense loads where air stream resistance is high. Completely automatic high-precision controls hold temperature variation to ±2° F.

At the right is shown a laboratory oven used by the general research laboratories of the Owens-Corning Fiberglas Corp. for polymerization of test samples of resin-bonded Fiberglas laminates. Specific requirements of this job are (1) the ability of the oven to operate within a temperature differential of 1½° F., and (2) its ability to evaporate large quantities of various solvents whose volatility ranges from inflammable to extremely explosive. It is also necessary that the oven harmonize in outward design and appearance with other equipment in this most modern research laboratory. In several cases, these units have been furnished with baked japan exterior finishes in a variety of colors.

If you have a heating or oven processing problem which is not yet satisfactorily solved, why not get in touch with **IOE?** It is quite probable that one of our standard designs can be quickly adapted to your needs.

FREE ENGINEERING DATA

"Blueprint For Industry" is the name of an 18-page book of engineering information on high-production convection-heated ovens for batch and continuous heating processes used in several types of industrial operation. It contains much general data of value to engineers, metallurgists and research men. Write today for your copy.

(This is No. 18 of a series. Reprints of previous advertisements sent free upon request.)

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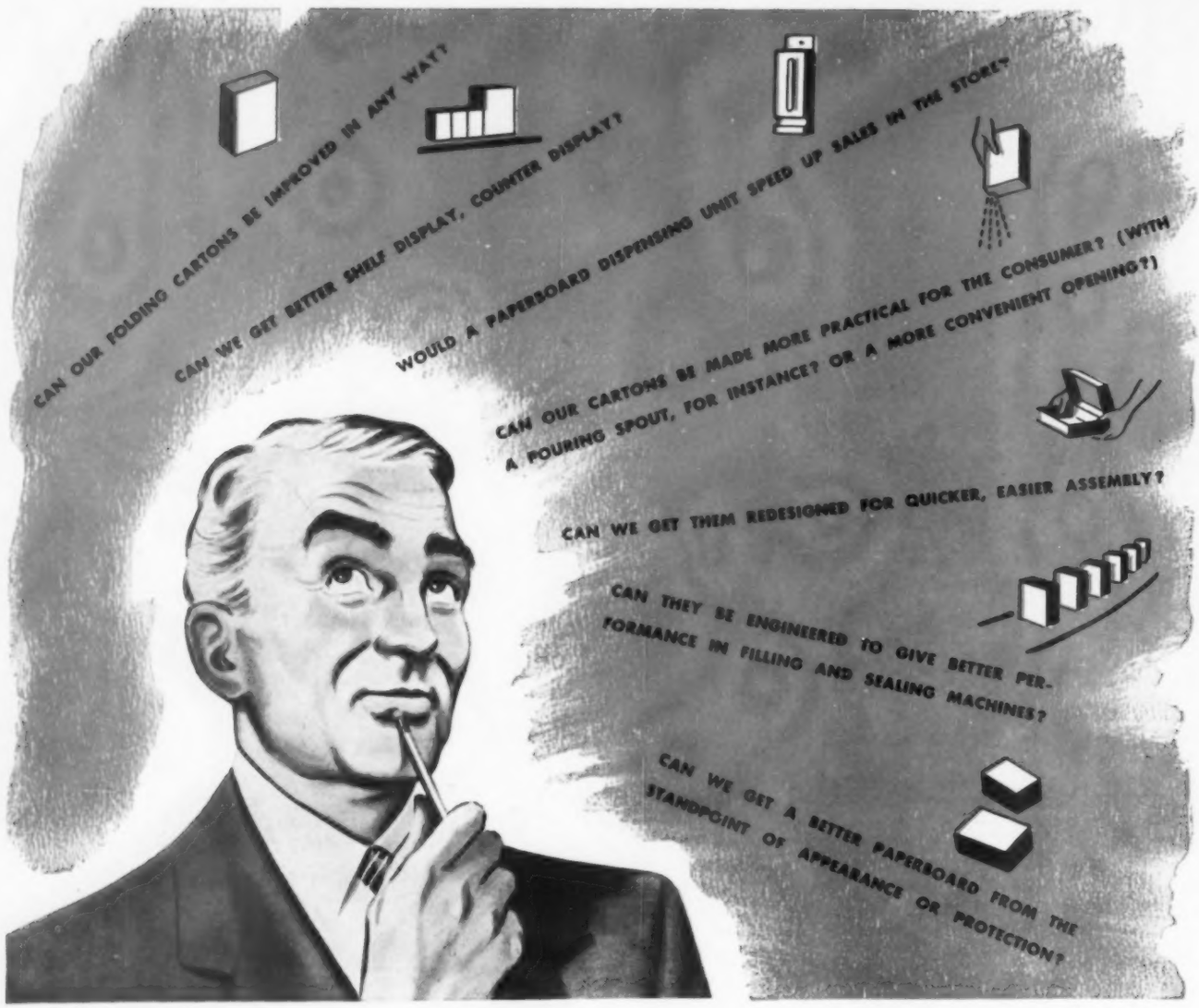

CAN OUR FOLDING CARTONS BE IMPROVED IN ANY WAY?
CAN WE GET BETTER SHELF DISPLAY, COUNTER DISPLAY?
WOULD A PAPERBOARD DISPENSING UNIT SPEED UP SALES IN THE STORE?
CAN OUR CARTONS BE MADE MORE PRACTICAL FOR THE CONSUMER? (WITH A POURING SPOUT, FOR INSTANCE? OR A MORE CONVENIENT OPENING?)
CAN WE GET THEM REDESIGNED FOR QUICKER, EASIER ASSEMBLY?
CAN THEY BE ENGINEERED TO GIVE BETTER PERFORMANCE IN FILLING AND SEALING MACHINES?
CAN WE GET A BETTER PAPERBOARD FROM THE STANDPOINT OF APPEARANCE OR PROTECTION?

How many of these folding carton questions should you be asking, right now? . . .

Better assume that your competitors are asking those questions. Which also means *you'll* not only want to ask them fast . . . but make sure you get *answers* that will make *your* packages the ones with the biggest *plus* after the war.

Gardner-Richardson experience, ingenuity and know-how have produced many entirely new developments in the folding carton field in recent years. Some of them may be the answers you're looking for: new dispensing cartons, new bulk display cartons, cartons with unique click-tops, pouring spouts, automatic lock ends. Today, Gardner-Richardson production is completely sold up. But our creative and technical staffs are ready to tackle the problem of bringing your folding cartons "up to the future." Write, today. No obligation, of course.

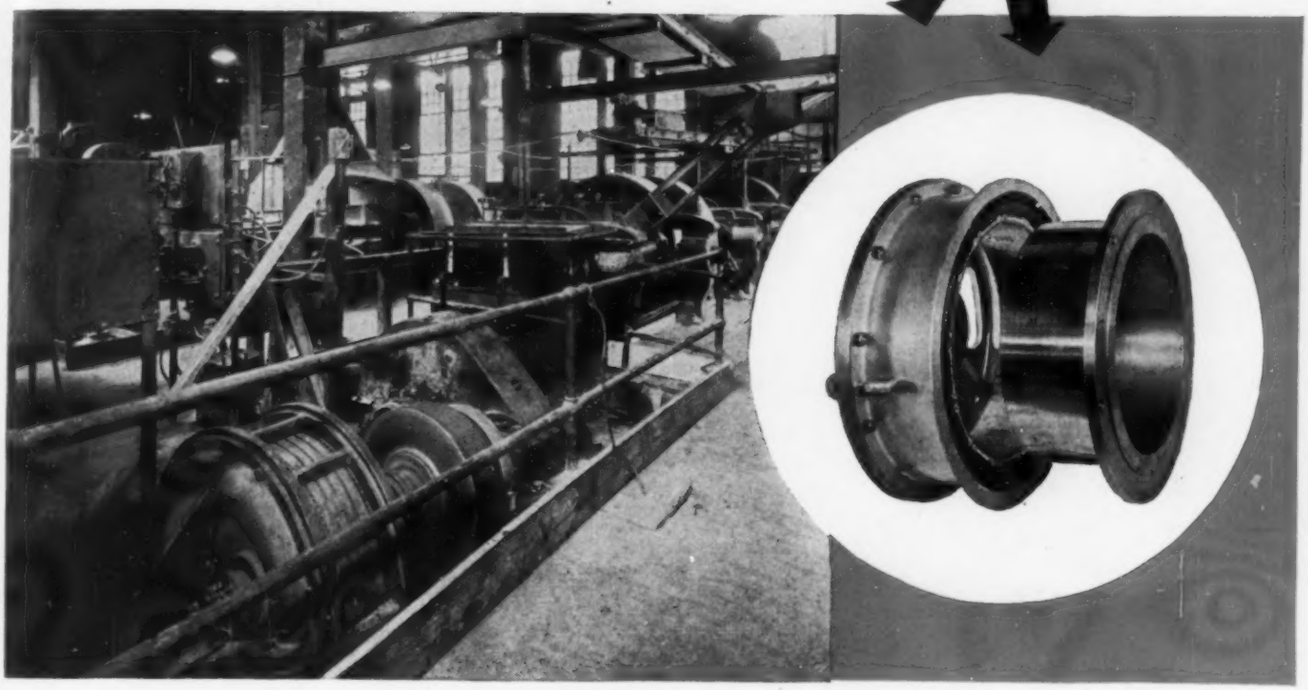
The GARDNER-RICHARDSON Co.

Manufacturers of Folding Cartons and Boxboard

MIDDLETOWN, OHIO

Sales Representatives in Principal Cities: PHILADELPHIA • CLEVELAND • CHICAGO • ST. LOUIS • NEW YORK • BOSTON • PITTSBURGH • DETROIT

Give your Rubber Mills a "Brake"



With this new and modern Clutch and Brake by Fawick, you can STOP the largest rubber mill QUICK—before damage is done to either equipment or operator. It more than fulfills all safety requirements.

And you can START the mill with equal efficiency, through positive control of torque by a cushion of air, in a gland of rubber and fabric.

The Fawick Airflex Clutch grips like a tire grips the road. A cushion of air absorbs shocks and vibration. There are no toggles, springs or levers—nothing to adjust, nothing to lubricate. Maintenance costs are unusually low.

The Fawick Airflex Clutch is designed for both new mills, and for quick and easy replacement on existing mills.

Write us today for details and engineering recommendations.

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FAWICK *Airflex* CLUTCH

POWER CONTROLLED BY AIR

for **INSULATED WIRE**

Tensile Strength

Resistance to aging

Dielectric strength

Write Our Technical Service Dept. for Details

MOORE & MUNGER

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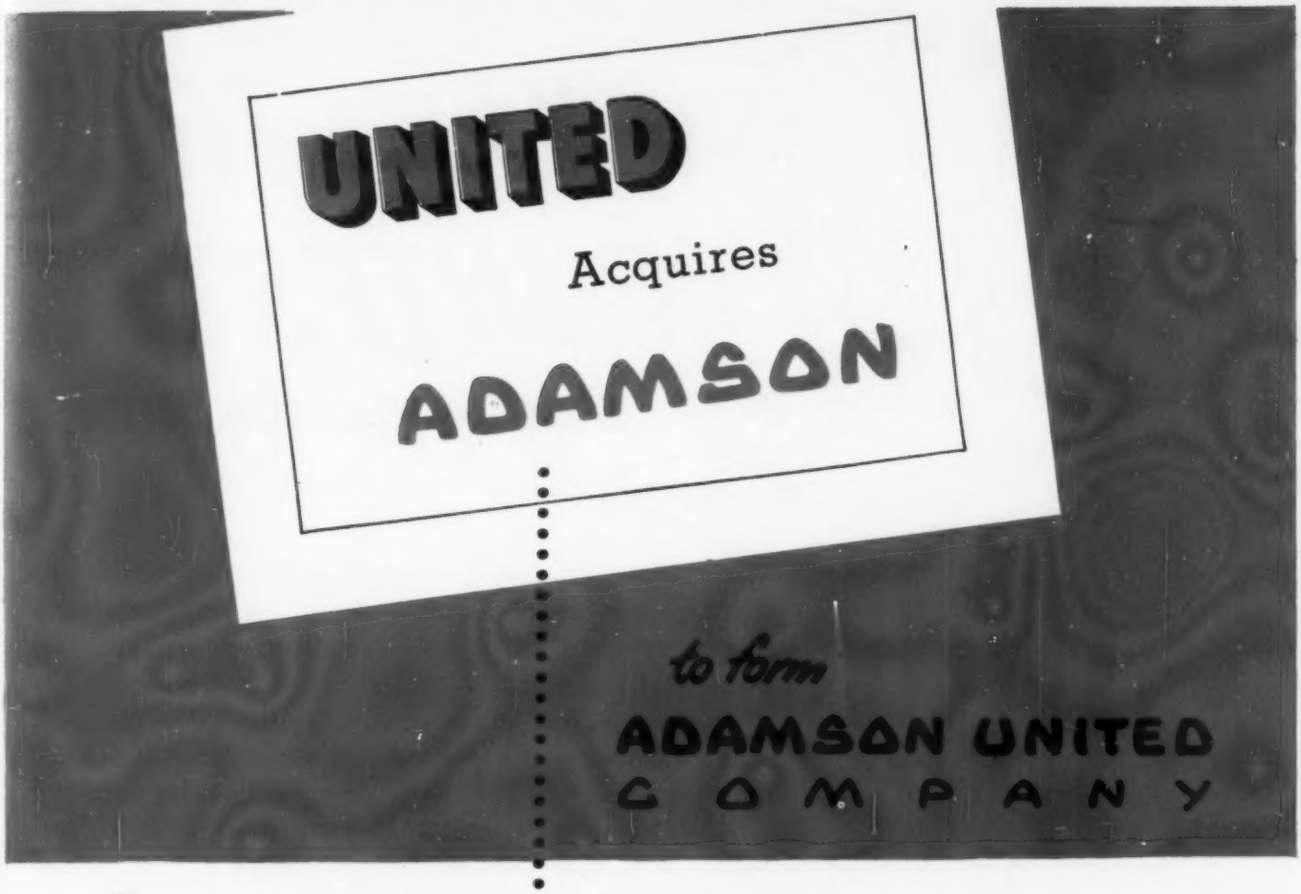

IN line with their policy of greater service to the rolling industry, UNITED ENGINEERING AND FOUNDRY COMPANY of Pittsburgh, Pennsylvania, have acquired the ADAMSON MACHINE COMPANY, located at 730 Carroll Street, Akron, Ohio.

Long and internationally known as one of the largest designers and builders of basic machinery for the Rubber, Plastics and Plywood Industries, this old established manufacturer will be known hereafter as ADAMSON UNITED COMPANY, a corporation chartered under the laws of the State of Ohio.

The new company, a wholly-owned subsidiary, will not only continue to engineer and build machinery for the manufacture of Rubber, Plastics and Plywood, but because of the additional facilities available, will have greater capacity for servicing existing equipment and a more comprehensive engineering service to offer the industry in the development of new processes and machinery.

***Products Manufactured by* Adamson United Company**

Calenders	Washers	Pot Heaters	Multi-Platen Presses
Mills	Driers	Ram Type Vulcanizers	Automatic Curing Presses
Mixers	Tubing Machines	Autoclaves	Belt Curing Presses
Refiners	Large Molds	Hydraulic Presses	Auxiliary Equipment

UNITED ENGINEERING AND FOUNDRY COMPANY
Pittsburgh, Pennsylvania

Plants at Pittsburgh, Vandergrift, New Castle, Youngstown, Canton

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**The World's Largest Designers and Makers of Rolls and Rolling Mill Equipment*

ENTER THIS CONTEST!

HELP AMERICA WIN

America needs your help in endeavoring to solve one of its most important problems—the problem of scientific utilization of synthetic rubber scrap. Synthetic rubber production, as you know, has been successfully accomplished. The proper handling and use of scrap synthetic rubber has not. Send us your ideas by entering this great contest. If your solution is judged best you may win up to $500.00. Read complete details below. Then decide to compete for one of the prizes.

Facts About This Big Contest

A group of rubber technologists identified with the rubber industry, known as the Chicago Rubber Group, is offering three prizes, totaling $1000.00 for the best papers on the utilization (reclaiming and processing) of cured synthetic rubber scrap. While the papers may deal with any phase of the problem, here are some subjects which suggest themselves: 1. Separation and segregation of synthetic scrap rubber. 2. Methods of identification of synthetic scrap rubber. 3. Reclaiming of synthetic scrap rubber. 4. Compounding studies which will result in greater use of reclaimed synthetic scrap, or of ground synthetic scrap rubber.

First prize: $500.00; second prize: $300.00; third prize: $200.00. If you feel that you have ideas of value for this contest, be sure to enter! You may win one of these substantial cash prizes.

READ THESE SIMPLE CONTEST RULES:

This contest is open to anyone in the United States or Canada excepting officers and directors of the Chicago Rubber Group for 1943-45. Selection of subject matter is left to the discretion of the contestant. As many papers as desired may be submitted by any one contestant. Papers should be based upon information which has not previously been presented before any technical society meeting or published in any trade magazine. Contest closes at midnight on August 1, 1945. Awards will be made during the fall meeting of the American Chemical Society in Chicago, 1945. The decision of the judges will be final. Each author must submit three copies of his paper to Mr. A. R. Floreen, Vice-President, City National Bank & Trust Company, 208 S. La Salle St., Chicago. These three copies will be judged separately by the Rubber Manufacturers Association, the Rubber Reclaimers Association and the Rubber Division of the American Chemical Society. The judges will report their findings to Bruce W. Hubbard, Chairman, Chicago Rubber Group, 2512 W. 24th Street, Chicago, to whom all inquiries for additional information should be addressed.

Sponsored by CHICAGO RUBBER GROUP, Chicago

Space donated by **A. SCHRADER'S SON** • **Brooklyn, N. Y.** • **Akron, O.** • **Los Angeles, Cal.**

Rubber Compounders

are making good use of these

Columbia Pigments

Both Calcene T and Silene EF are helping Compounders to produce a wide variety of desirable properties in GR:S and other rubbers.

For example, Silene EF is being used in critical items such as inner tubes, colored abrasion goods, products requiring high tear-resistance, and many molded products. Calcene T is being used with GR:S for wire insulation and other stocks where high tensile strength is required. Calcene T and Silene EF together are enabling the manufacture of a highly satisfactory GR:S "no-mark" sole and heel stock.

SEND FOR DATA

Silene EF is a white, finely divided calcium silicate, conferring high modulus, hardness, tear-resistance and good tensile strength up to high loadings. The closest approach to a "white carbon black."

Calcene T is a coated precipitated calcium carbonate product of extremely fine particle size, conferring low modulus, high tensile strength, high resistance to tear and abrasion, smooth, fast extrusion and good processing properties.

Complete data will be furnished on request.

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PITTSBURGH PLATE GLASS COMPANY

COLUMBIA CHEMICAL DIVISION

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Photo Courtesy Seiberling Rubber Co.

PELLETEX and GASTEX

Help "Kneading" of Synthetics

In the making of many synthetic rubber products, the operations take longer and require more care than in the case of natural rubber.

GASTEX or PELLETEX in the compound makes the material more plastic and easier to handle.

Put these long-established, leading semi-reinforcing furnace blacks to work for you. Our engineering staff is at your service for present and post-war production.

HERRON BROS. & MEYER

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2. Retained Flexibility

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Cellulose Resins
Melamine Resins
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and

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to

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Buna-N
Neoprene

THE BAKER CASTOR OIL COMPANY

Established 1857

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120 Broadway, New York 5, New York
Los Angeles, California
Bayonne, New Jersey

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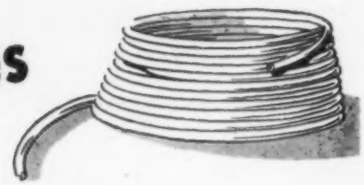

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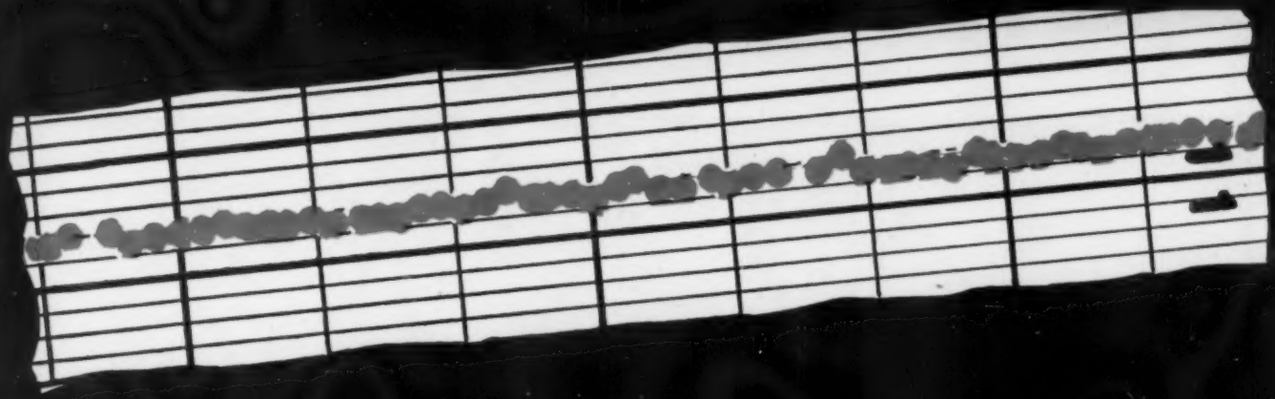

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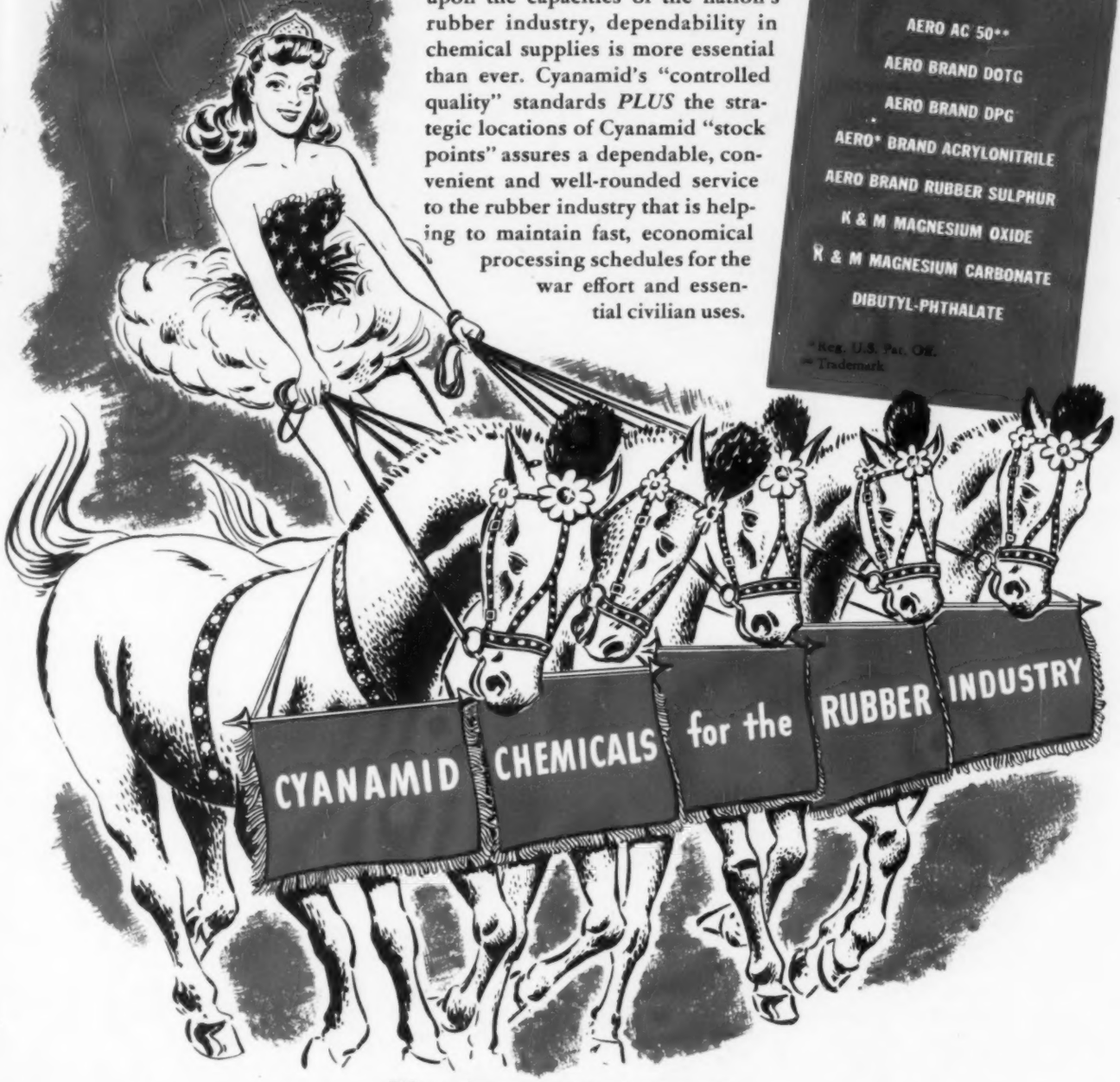

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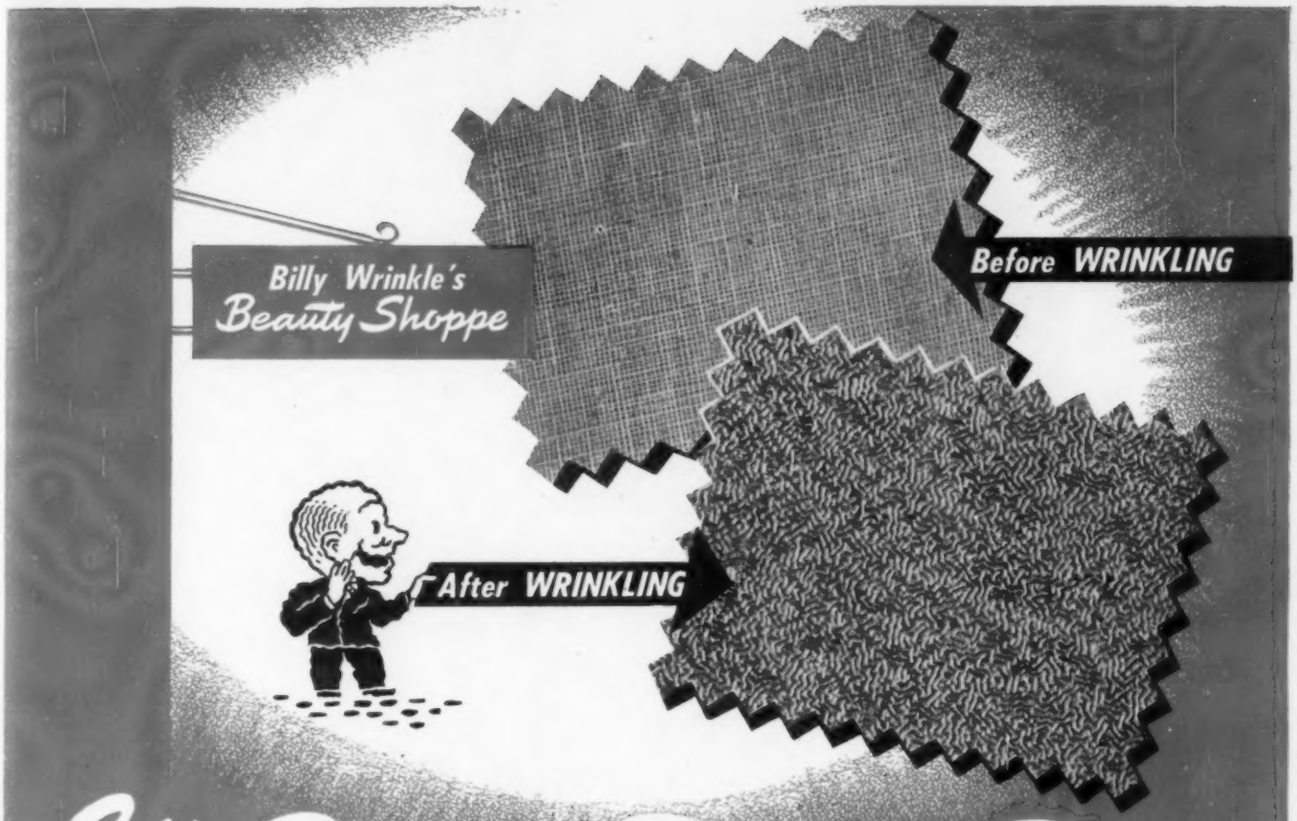

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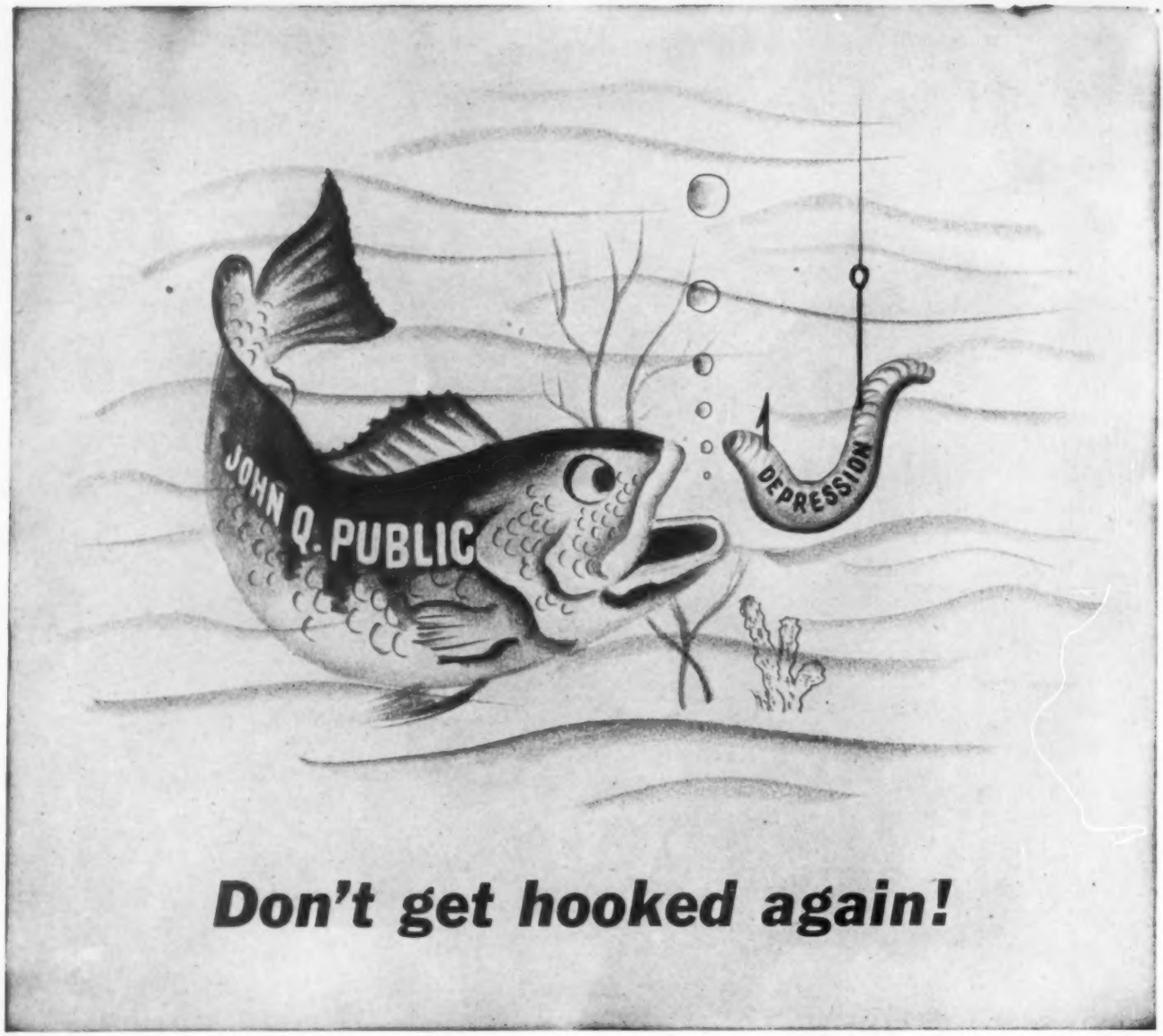

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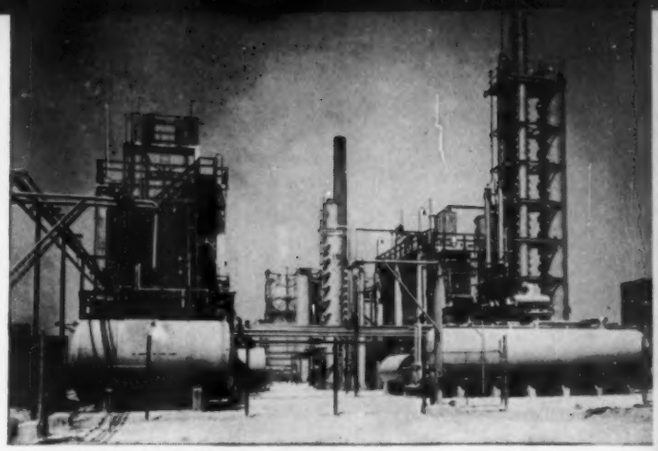

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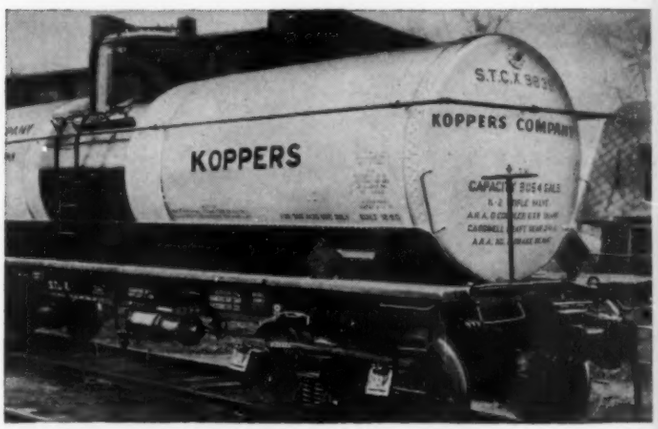

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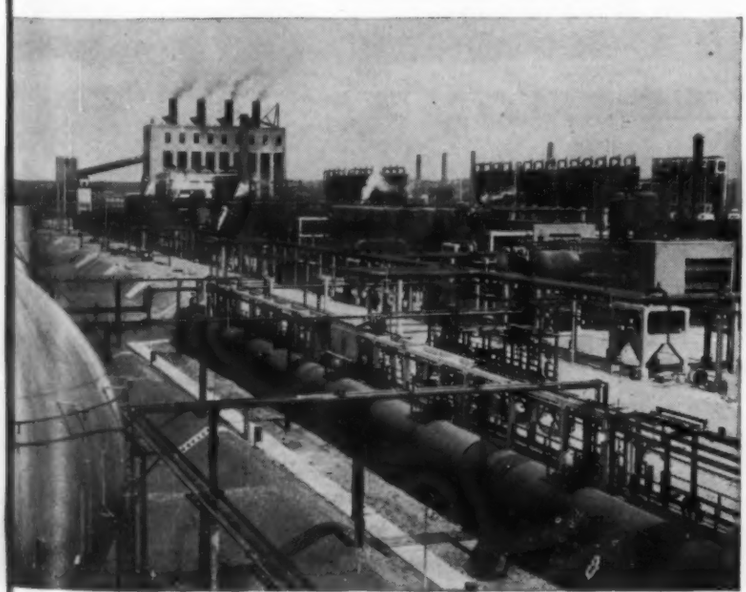

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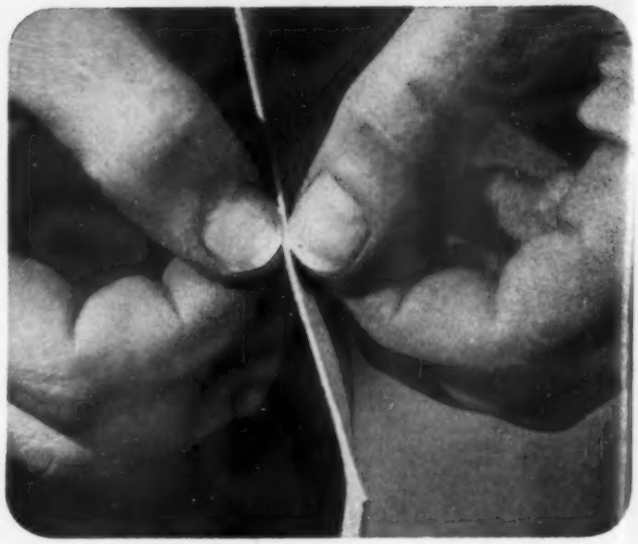

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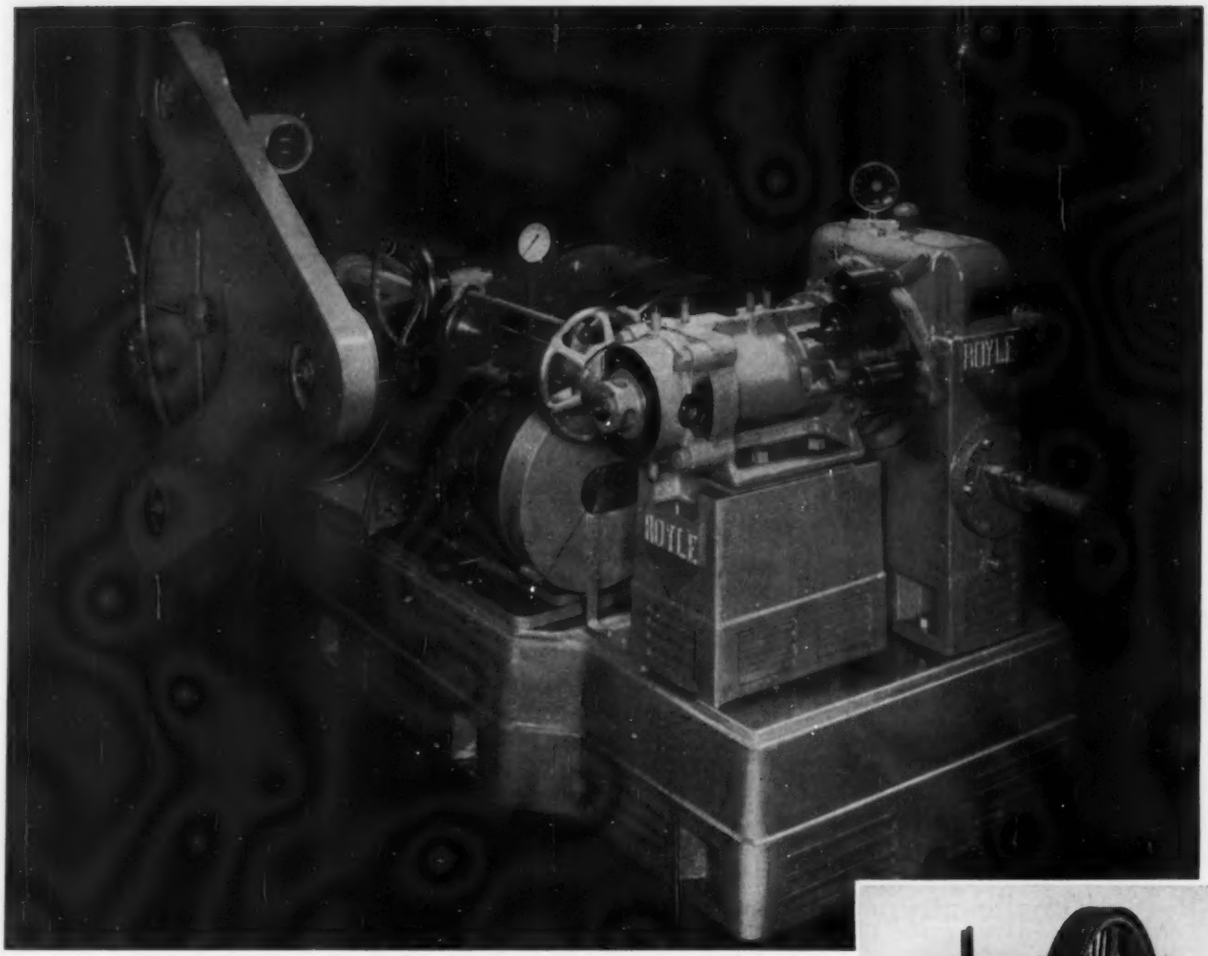

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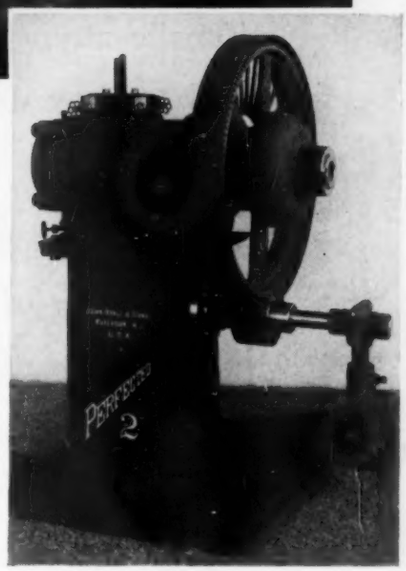

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The RUBBER AGE

VOL. 56, No. 5 FEBRUARY, 1945

Guayule Development in the United States

By ERNEST E. SCHOLL

District Supervisor, Government Emergency Rubber Project, San Antonio, Texas

In view of the renewed interest in the cultivation of guayule, the accompanying article, which reviews the birth, growth and current status of guayule in the United States, is both timely and topical. It is based on a paper delivered by the author under the title of "The Nation's Venture in Rubber Growing," at the First Texas Chemurgic Council, held in Dallas, Texas, December 6 and 7, 1944.—Editor.

EXPLORING the possibilities of procuring rubber from native American plants did not begin with the present war. Students of world affairs have long feared that some upheaval in the Orient might some day shut off our imports of rubber, and realized what that would mean to the nation's safety in the event of war, or to its general economy even if peace were maintained. The great inventor, Thomas A. Edison, spent much time during the latter years of his life investigating rubber-bearing plants, though he was not a botanist.

However, so used was the country to getting its rubber from across the ocean that few people realized there existed in this country and in Mexico an excellent rubber plant, which if necessary could under cultivation supply an important part of our natural rubber requirements. This plant, called guayule by the natives, is a low shrub with grayish green foliage and had long been known to the Indians of that section. They had discovered that by chewing the bark, a gum could be extracted which could be molded into a ball that bounced.

In September of 1852, a Dr. J. M. Bigelow, who was attached to the Mexican boundary survey, found and collected a specimen of this plant and, since it was new to him, sent it to Professor Asa Gray of Harvard University for identification. Professor Gray found that the shrub was also new to science, so he named it *Parthenium argentatum*, and described it in his "Botany of the Boundary" published in 1859.

Due to the discovery of the principle of vulcanization by Goodyear, rubber was rapidly finding wider use, and in 1896 the Mexican state of Durango sent an exhibit of guayule to the Centennial Exposition at Philadelphia in an effort to interest foreign capital in its development. The project failed because so far no suitable method of extracting the rubber from the plant had been devised.

American capitalists became interested in guayule and in 1902, William A. Lawrence, an American chemist who had been experimenting with chemical extraction of the rubber, hit upon the idea of duplicating the Indians' masticating method on a large scale. He found that the "pebble" mill used in ore reduction was adapted to the purpose, and in 1905 the Continental-

Mexican Rubber Company built a mill at Torreon, Mexico. Later other mills were built in that country and for a time a mill operated at Marathon, Texas. It was finally dismantled in 1926. Ever since the institution of the industry, there has been a steady production of guayule rubber, most of it shipped to the United States. In the early years of the century, a very considerable proportion of the rubber used in this country was guayule rubber.

Early History of Development

Early in the history of guayule development, the proprietors began considering the possibility of growing the shrub under cultivation. They realized that the supply of wild shrub would some day become exhausted, since the plant reproduces and grows but slowly on its desert range. In 1907, the Continental-Mexican and Intercontinental Rubber companies employed Professor Francis Ernest Lloyd of Alabama Polytechnic Institute to make a study of the plant. The results of his work were published in 1911 in the monograph, "Guayule, a Rubber Plant of the Chihuahuan Desert," which is still considered to be the principal authority on the physiology of the plant.

In 1911, the companies employed Dr. W. B. McCallum to start experiments in the culture of the shrub. The following year he was forced to move out of Mexico because of the revolution. He settled on a tract of land near Valley Center, California, and planted a considerable acreage of the shrub. In 1916, he decided to try growing the plant under irrigation and moved to Continental, Arizona. While there, he also set out a number of experimental plots in California, Arizona, New Mexico, and Texas, and on the basis of these plots decided that the Salinas Valley of California offered the best possibilities for commercial development of guayule. Accordingly, he established headquarters there in 1925.

Among the test plantings made in Texas were plots at Linn, Hebbronville, Dilley, Pearsall, and Luling. Some of these made a splendid showing, but Dr. McCallum's work was rapidly expanding in California, and the Texas work was more or less neglected. By a process of careful selection, Dr. McCallum over a period of years picked out a number of strains of guayule which have high producing properties and other desirable characteristics. He is still working on improvement of the plant as a member of the Emergency Rubber Project.

The company got several thousand acres planted to guayule chiefly in the Salinas Valley of California, and built an extraction mill in 1930. During the next ten years the mill was run four times, processing the shrub from about 4400 acres and producing 3,068,630 pounds of crude rubber. A greater acreage had been planted, but during the disastrous break in rubber prices in the early thirties, some of the contracting farmers plowed up the crop.

The possible value of guayule to the United States in the event of war was recognized in some quarters several years ago. In 1930, the army sent a couple of officers, one of them General Dwight D. Eisenhower, then a major, to make a study of guayule production at Salinas. They made a favorable report on the subject, recommending "that the Government develop guayule as insurance against complete absence of a rubber supply in the event of war."

Before the outbreak of war in 1941, Representative John Z. Anderson of California introduced a bill designed to promote guayule rubber production by the Government, but nothing came of it. Immediately after the outbreak of war, however, the bill was reintroduced and passed. It authorized the Secretary of Agriculture to purchase the properties of the Intercontinental Rubber Company in the United States and to develop a 75,000 acre guayule production program. The Department directed the Forest Service to assume over-all charge of the program, and very shortly the Emergency Rubber Project was organized. The Bureau of Plant Industry, Soils and Agricultural Engineering began research work on the culture of the plant while the Bureau of Agricultural and Industrial Chemistry took up extraction research and the Bureau of Entomology and Plant Quarantine began studying insect enemies.

Due to the pressure for all out production of food and fiber crops, the guayule program was curtailed in the spring of 1943, so that actually only about 32,000 acres were established. Nearly all of this is in California, but in order to study other areas possibly suitable for guayule culture, a number of experimental plantations were made in Arizona and Texas.

In the work to delimit the areas adapted to guayule culture, surveys were made in California, Arizona, New Mexico, and Texas. The plant is confined by climate to a zone some 100 to 150 miles wide along the Mexican boundary to California, thence north in that state to about the latitude of Chico. After an exploratory survey which eliminated the obviously unfit areas, 22,000,000 acres were covered by a reconnaissance survey and more than a million acres by detailed surveys of individual tracts.

This survey work discloses that there are 5,651,000 acres suitable for growing guayule. Some of this land is better than other for the purpose; it ranges from very high grade irrigated land to ordinary dry land. Of the total, about 2½ million acres is uncleared brushland in the Rio Grande Plain of Texas. This land is now used for pasturage, but it has the necessary characteristics for successful guayule growing.

Results of Initial Milling

None of the guayule planted by the Project has so far been milled, though the harvest is beginning this winter. It is planned to start the Salinas mill shortly, and an additional mill is being constructed at Bakersfield, California. The Project did mill a field acquired from the Intercontinental Rubber Company in 1943. The field contained 550 acres and produced 880,268 pounds of rubber, an average of 1600 pounds per acre. It was growing on dry land, and had probably passed its prime. Later, the Project re-harvested the wild guayule area in the Big Bend section of Texas, where the old Marathon mill had previously operated. The baled shrub was shipped to the Salinas mill where it produced about 500,000 pounds of rubber.

Following in the earlier footsteps of Dr. McCallum, the Project set out test plots at many places in Texas as well as in California, Arizona, and New Mexico. These have been carefully studied by plant scientists, and the results recorded. Some of them have served their purpose and been removed. At present, there are 70 such test plots. Thirty-two of them are in Texas, fourteen of them maintained in cooperation

with the Texas Agricultural Experiment Station and other state institutions. There are also some larger research fields located at Pearsall, Edinburg, and Raymondville. Similar fields are located in California and Arizona.

A considerable amount of interest has developed among agriculturists in the possibility of adopting guayule growing into the agricultural pattern, particularly in the Rio Grande Plain country of Texas. There is also a strong feeling that while the research program has uncovered a great deal of valuable information, there is still much more to be learned and that the research work should continue.

Congressional Investigation

Early in 1944, a Congressional Committee headed by Representative W. R. Poage of Texas made an investigation of the guayule growing program from California to Texas. Later in the year some members of the Committee made another check of the situation in Texas and Mexico. (EDITOR'S NOTE: This committee submitted a report to Congress on January 2, 1945, recommending that the Government withdraw from the production of guayule but continue experiments in growing and processing and that in order to encourage private cultivation the Government establish and guarantee a definite floor under the price of domestically produced guayule for a period of from 7 to 10 years).

By virtue of the research program which has been carried on and the experience gained in operating the nurseries and plantations and in running the mill, widespread advances have been made in the science of guayule rubber production. A few of the important ones follow.

Guayule is ordinarily propagated from seed. In the past, it was considered necessary to put the seed through a chemical treatment and even to pre-sprout it in order to secure prompt and uniform germination. It is now found that under proper storage conditions the seed will emerge from the dormant stage naturally after about a year, thus avoiding both the expense of the processing and the wastage of seed in case weather or soil conditions are such that it cannot be planted immediately upon becoming sprouted. A means of threshing the seed has also been developed, and since guayule seed is quite bulky in its natural state, threshing, where desirable, will reduce storage and handling costs.

The Project has vastly increased the amount of seed available for planting. Whereas it began with 23,000 pounds, purchased from the Intercontinental Rubber Company, it now has on hand 376,000 pounds. This was made possible largely through the development of a seed harvesting machine, which does the job rapidly and efficiently.

The traditional method of growing guayule is to start the plants in a nursery, and then transplant them to the field. Experiments are now under way in planting the seed directly in the field. On irrigated land of certain characteristics the method has good possibilities and experiments are under way to determine whether it can be adapted to dry land where rainfall and growing temperatures seem to be favorable.

Light weight, 4-row transplanting machines have been developed, which with a trained crew, often of women, will plant around nine acres per day. Weed

One of the guayule nurseries maintained at Salinas Valley, Calif., by the Emergency Rubber Project. The seedlings are approximately three months old.

control, especially in the nurseries, is a big job when done by hand, but it was found that certain oil sprays which kill weeds do not damage guayule, if properly applied. The oil spray is used in the fields as well as the nurseries to reduce the amount of hoeing required.

In standard practice, the guayule shrub is dug up roots and all in the harvest. Under ordinary conditions, it is allowed to grow until the rubber increment no longer over-balances cost of maintenance, which on the average may be about four years on irrigated land and five or six years on dry land. Experiments are now in progress, however, looking toward harvesting only the tops of the plants, and allowing new shoots to grow from the stumps. While it is still too early to tell what effect this cropping may have upon the life of the plant, or how frequently it can be done, the preliminary results seem quite encouraging.

Much has been learned about methods of encouraging the shrub to put on rubber, especially on irrigated land. The rubber is deposited principally in a layer of cells under the bark and an alternation of growth and dormancy promotes rubber deposition. Manipulation of the water supply, harvesting at the proper season, and proper handling of the harvested shrub, all have a bearing on rubber yield.

Pebble Mill Method Still Used

The pebble mill extraction method invented by Lawrence is still in use. Briefly, the dried shrub is crushed through a series of rolls, then mixed with water and introduced into the pebble mill, which is a large tube about half filled with pebbles. As the tube rotates, the falling pebbles mascerate the shrub and liberate the rubber particles, which adhere to each other to form small clumps or "worms." The mass then enters a tank where the plant fibers sink, but the rubber "worms" float and are skimmed off the surface, dried, and pressed into blocks. Certain refinements developed by the Project result in recovery of a larger proportion of the rubber from the plant material, and also production of a better grade of rubber.

An active research program is going on looking toward further improvement in the extraction process. Experiments are being conducted in the use of the Jordan paper making machine to replace the cumbersome pebble mills and preliminary results are quite promising. The Jordans cost less, use much less power, and require a great deal less floor space. One revolutionary prospect being investigated is the possibility of extracting the rubber as latex from green shrub rather than as gum from dried material. The latex makes a much superior grade of rubber, but so far it has not been possible to extract a sufficiently large proportion of the rubber in that form. The eventual solution may be to extract a part of the rubber as latex and mill the residue for the remainder in the conventional way.

The foregoing serves merely to highlight the investigative work which is designed to reduce the culture and processing of the plant to its simplest terms. Of equal or greater importance, however, is the plant breeding research, the aim of which is to improve the productivity of the plant, and increase its tolerance to climatic and soil conditions.

Dr. McCallum's work was confined almost wholly to selection among the many existing strains and varieties of guayule, but the geneticists see no reason why the best of the existing strains may not be further improved by plant breeding as most other crop plants have been improved. The best of the existing strains produce up to 20 or 22 per cent of their dry weight in crude rubber and the research workers are confident that this can be increased.

There is also the field of by-products, which has practically not been touched. The entire plant is brought into the mill, but some 80 per cent of it passes out as waste. Since the purpose of the Project was solely to produce rubber for the war effort, only fragmentary research has been done on by-products and there may be a fertile field there for future development.

Now a word about the uses of guayule rubber, particularly since our supply of natural rubber from the Far East has been cut off. For several years before the war, chemists both in America and abroad had been experimenting in the development of synthetic rubbers, and a number of compounds had reached the point where they were being manufactured in this country on a small scale. When the war broke out it was thus possible to quickly go into large scale production—a fortunate circumstance of the utmost importance to us in the conduct of the war.

These synthetics do not meet all of the requirements of rubber use, however, some natural rubber being necessary in the manufacture of the larger sizes of tires, in bullet-sealing fuel cells for military aircraft, for certain medical supplies, and other purposes. Also, mixing natural with synthetic rubber improves the workability and physical properties of the latter, and aids in its ready assimilation of carbon black.

Guayule is natural rubber, the chemical structure of the molecule being identical with that of Hevea rubber. Because the entire plant is ground up in the extraction process the crude acquires a certain amount of resins and other impurities which make it less valuable than Hevea for some purposes, though it substitutes for it readily in others. There has never been lack of a ready market for guayule even when East Indies' rubber was abundant. Recent tests by the B. F. Goodrich Company in substituting guayule for Hevea rubber in the critical outer plies of certain heavy-duty tires showed that guayule was satisfactory for the purpose. Incidentally, those tires which were run to the point of failure all failed in some respect other than in the guayule plies.

Whether or not guayule will be able to catch on as a full scale post-war agricultural enterprise in this country depends upon a number of conditions, some of which cannot now be evaluated. It has one characteristic which would tend to make it a welcome addition to southwestern agriculture—it is exceptionally drought resistant. Where annual farm crops may completely fail because of drought, guayule merely stops growing until it rains again. In fact, it utilizes the interruption to put on rubber.

Some Additional Data on the Cycle-Weld Process

EXCELLENT results in bonding both natural and synthetic rubbers to various materials by the Cycle-Weld Process, a development of the Chrysler Corporation, have been reported from time to time. The process gives high bond strength and is particularly adaptable to aircraft construction within the limitations imposed by the curing heat required. Although the cements used in the process may not yet be disclosed, some details of the procedure employed were given by J. F. Mason, of the Glenn L. Martin Co., in an article on "Adhesives and Sealants," in the January 15, 1945, issue of *Automotive and Aviation Industries*, as follows:

The rubber to be bonded to any surface must first be cyclized by treatment with concentrated sulfuric acid for 5 to 10 minutes. The other material to which the rubber is to be bonded must be cleaned thoroughly, but in such a manner as not to have a deleterious effect on the surface. The rubber, after the acid treatment, should be thoroughly washed with water and dried. It is then flexed to produce a finely cracked surface. The cyclized rubber surface and the cleaned surface of the other material are then coated evenly with the Chrysler cement by brush or spray. A predrying period is required before the bond is affected. The cement coated surfaces may be air dried for four hours or air dried for 30 minutes then baked at 180°F. for 10 minutes. The assembly is then made and pressure (approximately 30 psi) is applied to insure intimate contact between the cement coated surfaces. The assembly is then cured by the suitable application of heat. The curing cycle is approximately 15 min. at 300°F. or a lower temperature of 260°F. for one hour.

This process should not be used indiscriminately in aircraft production. It should be used only when careful consideration has been given to the assembly involved. It is particularly adaptable to the bonding of flat sections, but curved assemblies will require special jigs for curing. Note: There are other Cycle-Weld cements used for bonding ferrous, and non-ferrous metals, wood, glass, plastics, etc., to themselves or other materials.

Some Technical Aspects of Rubber Reclaiming

By F. B. MENADUE, F.A.C.I.

HOW can scrap rubber be better utilized? Can "vulcanization" be more truly "reversed" and a product obtained closer in properties to the original raw rubber? The latter question is justified and important because of the still vital rubber position and the absence of definite evidence that the ultimate in reclaiming has been reached. It remains provoking and a challenge to chemical thought. If the rubber hydrocarbon in existing scrap rubber could be so reclaimed as to equal raw rubber, it would represent a considerable increase in stocks of raw rubber; every 5% improvement would prove of statistical importance. Furthermore, the higher production costs of synthetic rubbers and the need for reclaiming such rubbers adds a new element to the science of reclaiming.

Reasoning from theoretical grounds, the pre-requisite for the understanding of the physical and chemical action of reclaiming should be the understanding of the phenomena of elasticity, as possessed by rubber, and vulcanization. But the fact remains that despite a coordination of general scientific investigation during the past few years, a coordination never before achieved, these phenomena have not yet been explained sufficiently for a working formula or hypothesis. The type of research characteristic of rubber institutions and manufacturing establishments must therefore be continued, and it may be expected that, as in the past, not only facts of direct practical value to reclaiming but also those of value in explaining vulcanization and polymerization will be discovered.

Modern Developments

Advances that have been made to date are in the more definite use of oxygen, the use of the more complex plasticizers, and in the application of high temperatures. However, general experience will probably agree with that of the author that while reclaim as currently produced can be used for some purposes to even better effect than natural rubber, such reclaim must still be evaluated much below natural rubber when used for tire treads or other products which call for considerable flexing and abrasion resistance.

The obvious logical line of attack on the reverting of vulcanization is that of removing the substance producing the action, *i.e.*, sulfur, but as yet no factory process appears to have accomplished this. In laboratory work, Spence *(1)* by the use of sodium and aniline has removed 80% of the combined sulfur, while Winkelmann *(2)* has described the fact of a chloroform extract of a reclaim, amounting to 43% of the total rubber hydrocarbon, containing only 7% of the combined sulfur of the original vulcanizate. It is important that no improvement in the physical condition of the products, corresponding to the reduction in the sulfur, was mentioned by either investigator.

The standard alkali process used in the reclaiming of rubber removes only the free and lightly combined sulfur, and it seems apparent that the principal factors involved in the process are the high temperatures, the added oils, the action of the steam and water in swelling the product and dispersing the molecular arrangement, and the probable effect of salts formed and oxygen. The average reclaim secured by the alkali process is probably a little superior in general properties to those secured by other methods, but it is significant that the improvement is not greater than it is considering the sulfur that is removed.

The action of pigments on rubber has been shown by Twiss and Wiegand and others and by the author *(3)*. Also, the necessity of the presence of carbon black for trinitrobenzene (TNB) to function as a vulcanizer is well known. This action by carbon black is reflected in the fact that a carbon black-rubber, such as a tire tread, shows a greater drop in tensile during reclaiming than probably any other rubber. This is important, and it would appear that the problem of "reverting" this carbon black-rubber product should be regarded as distinct from that of sulfur-rubber products.

Effect of Oxygen

Although there may be some doubt as to whether oxygen plays a part in the digesting operation in the alkali process, there is no such doubt as to its importance in the grinding of the scrap, which may be regarded as on a parallel with that of oxygen in the mastication of raw rubber as shown by the well-known works of Cotton *(4)*, Porritt and Fry *(5)*, and others.

The remarkable potency of oxygen on oil-rubber mixtures at temperatures of even 300° F. and the possibility of its entrance into the autoclaves would justify the contention that in the ordinary oil reclaiming process it is an important factor. When it is deliberately admitted together with the steam it can produce an ultimate similar effect if carefully controlled, but such control is extremely difficult. In the case of the process of heating a full tire at the high temperature of 225° C. or more, it is obvious that oxygen can have no effect on the internal rubber, but the outside of the tire is highly affected, and as in the case

of the alkali and oil processes the eventual grinding on the mill brings oxygen of the air into action.

Another manifestation of the action of oxygen is in the case of reclaiming scrap tires compared with freshly vulcanized tires. It is clear in such comparisons that, in the case of the old tire, aging of the rubber has supplemented, or been auxiliary to, the reclaiming operations, and although the effects of heat and time, and the phenomenon conveniently described as "fatigue," are factors in this weakening or, actually, deterioration of the rubber, oxygen must be regarded as a contributory cause.

High temperature heating has opened up an important phase of reclaiming, notable for speed of output. As yet, however, there is some doubt as to what extent it yields a product of the true rubber hydrocarbon properties. The care and control that is necessary to produce a regular product is indicated by the discovery of Staudinger and Geiger *(6)* that heating rubber in vacuo slowly to 300° C. converts more than half of it into a solid isomer, but heating it rapidly, preferably in vacuo, converts it into volatile products. It would seem, therefore, that the method provides possibilities of producing reclaim of special types of processing properties.

Probably because of the low sulfur content of modern day rubbers, methods employing oils and softeners compare quite well with the alkali process, particularly with products of high rubber content. The reclaiming action of the oil types of softeners is partly due to their swelling action which renders the rubber more susceptible to the simple action of comminution by mechanical means, but the main action of softeners generally is in their weakening of certain bonds of attraction consequent on vulcanization. With the aid of heat, different softeners perform this action at different rates, and the action of oxygen is increased with the amount of the softener employed.

It would be interesting to learn just how much the continued presence of the softener is necessary to maintain the essential nature of a reclaim, the degree to which it affects such properties as elongation and tensile strength, and how it compares to the action of plasticizers on such materials as polyvinyl chloride.

The action of surface active agents appears to be essentially that of preventing the rubber from again cohering when in the process of being comminuted, thus in a sense acting as a "wedge." These agents in themselves, therefore, have little or no plasticizing effect, but the plasticizing that takes place due to the mechanical action and to oxygen in the course of such action is an important feature.

Rubber Crumb

Of much interest and importance in the study of reclaiming is the fact that rubber crumb may be made to cohere sufficiently to give high tensiles. Some actual figures are shown in results achieved in the following tests conducted by the author:

A carbon black tread rubber, which had been freshly vulcanized, was ground very fine, and 1% of zinc oxide, 1% of sulfur, and ½% of diphenylguanidine (DPG) added. The resulting mixture was then passed through an even speed mill at a temperature of 90° to 110° F. until it contained no visible holes. The "mean" gauge was 15/1000 and plied to 120/1000 and cured in a 70/1000 mold for 15 minutes at 60 pounds pressure. A tensile of 2,250 lbs./sq. in was obtained. Different samples of rubber obtained from tires that had been worn almost to the breaker gave tensiles of 1790 to 1950 lbs./sq. in. in the direction of calendering and 1470 to 1650 lbs./sq. in. at right angles. The elongation ranged from 250% to 320% and the set to 7 to 10% at break.

Compared with the results given above, the highest breaking strain obtained over a number of years from a considerable number of alkali processed tire reclaim vulcanizates has been 1250 lbs./sq. in. Several makes of tire reclaim used in vulcanizates containing the following ingredients: reclaim, 75; smoked sheet, 20; diphenyl guanidine, 0.25; zinc oxide, 2; and sulfur, 3, gave breaking strains from 1380 to 1670 lbs./sq. in. only. Even without the addition of sulfur and accelerator, milled and sheeted scrap press cured for 10 minutes at 70 pounds pressure gave tensiles of 1510 lbs./sq. in.

This difference in favor of the scrap or crumb against the scrap in the reclaimed condition is of interest from the standpoint of rubber structure and vulcanization, as well as of value in reclaiming research. How much reclaiming by ordinary methods is merely a compromise between strength and processability is a moot question. It seems certain that continuance of the action towards a point where the product possesses similar absence of "nerve" or behavior to solvents as well masticated raw rubber causes a continued reduction in strength.

It is apparent that the ratio of strength to plasticity and processability can be adopted to advantage for comparing the relative value of different reclaiming processes, with due consideration also of the drop in strength from that of the original rubber.

Summary and Objectives

From this brief review several points stand out prominently, as follows:

(1) Reclaiming as at present known effects only partial removal of the substances responsible for the changes of vulcanization in the first place.

(2) Such reclaiming destroys or partly destroys the potential power of certain inter or intra molecular bonds of attraction in the comminuted rubber scrap, and subsequent vulcanization or any other known process cannot reinstate this lost power.

(3) A highly important agent for bringing about the action of reclaiming is that which causes plasticizing of rubber in the raw state.

Based on the above, several lines of research apart from those indirectly referred to present themselves, including the following:

(a) The investigation of the difference of sulfur content in the chloroform extract of a reclaim from that in the remaining portion as shown by Winkelmann.

(b) To what degree is oxygen essential for plastication? To what extent can oxygen be replaced by other agents? And in what way does the action of these agents differ from that of oxygen?

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Sealing and Seal-Aging Properties of Rubber Gaskets

An Account of an Investigation of Medium Soft Natural and Synthetic Rubber Gaskets for Various Types of Closures

By T. A. WERKENTHIN[a], A. D. SWENSON[b], C. K. CHATTEN[c], and R. E. MORRIS[d]

(Concluded from the January, 1945, Issue)

The design of the latest Naval Research Laboratory apparatus was directed by one of the authors at a correction of the three above-mentioned limitations. The instrument consists of an indentor (J), Fig. 19, which is a micrometer screw having 40 threads per inch, the indentor point of which is a hemisphere of the same radius as the diameter of the sealing bead or knife edge of an actual door. Longitudinally, through the center of the screw, is a small hole, through which pressure is applied, emerging at the center of the hemispherical surface. The point of the screw indentor is, in effect therefore, a sealing edge, curved around the small hole. The micrometer screw indentor is supported in a vertical position so as to allow the screw to be turned down into the rubber sample placed directly beneath. Since the pressure to be measured is in terms of pounds per square inch, the final result is independent of the area of rubber actually under pressure. Thus, the indentor screw is at once a sealing edge, a pressure chamber, and a micrometer for measuring the depth of indentation. The rest of the instrument consists only of a frame (B) to support the screw and a holder (C) to secure the rubber sample (F) to the base plate. A dial (D) graduated according to the number of threads per inch on the screw is attached to the frame and records the extent to which the screw is turned. The specimen holder is designed to hold not only the rubber specimen but enough water to show bubbles upon leakage.

The procedure for the operation of the apparatus is as follows: The test specimen is a cylindrical disk ½ inch in thickness, cut by means of a sharp, circular die having an inside diameter of 1.129 plus or minus 0.001 inches. In cutting the specimen, the die is suitably rotated in a drill press or similar device and lubricated with soapy water, so that a smooth-cut surface having smooth edges is obtained. The diameter when calipered should not vary by more than minus 0.001 or plus 0.002 inch. The cutting pressure should be kept sufficiently small to avoid "cupping" of the cut surface (see Fig. 19). The disc sample is inserted all the way into the sample holder (C). The threaded shim (E) is placed in the sample holder and turned down until it barely makes contact with the bottom of the sample. The rubber should not be compressed by turning the shim too far. The point of contact should be accurately determined by lightly turning the shim on and off the bottom of the rubber several times, stopping at the point when the first light contact is felt.

The sample holder is then placed in the proper receptacle of the jig, as shown in Fig. 20. The plunger (A) should then turn down until the contact point first makes contact with the top surface of the rubber. The sample holder will prevent a visual determination of this point, but it may be easily determined by filling the holder (C) to the rim with water and turning the plunger down to that point where bubbles just fail to form by supplying to the plunger air pressure with the mouth. A short length of rubber tubing should be used in this operation. The process should be repeated several times until the operator is satisfied that this

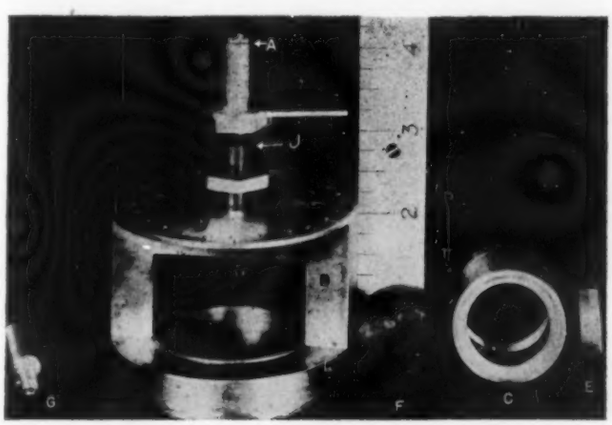

Fig. 19.

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Note: The opinions or assertions in this article are those of the authors and are not to be construed as official or reflecting the views of the Navy Department or the Naval service at large.

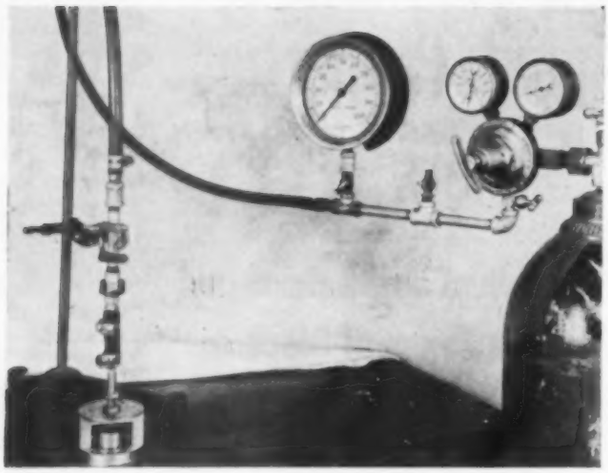

Fig. 20.

point is consistent to within one-half of a thousandth of an inch, *i.e.*, one-half of a division of the scale.

From this point the plunger shall be turned downward the desired indentation; for example, 1/32 inch (0.031 inch) will require one complete revolution plus 6 divisions of the dial (D) making 0.031 inch. The lock nut is then tightened against the dial so that the plunger shall be firmly fixed. The adapter (G) is connected to the pressure system.

By using a medicine dropper, water is added until the sample holder is filled full. The pressure required to cause leakage is then determined as follows: Enough air is added to cause profuse leakage. This pressure is then released until leakage diminishes to a rate of one bubble every 10 seconds. In the event that the leakage stops entirely, the pressure is again turned up until excess leakage again occurs and then slowly diminishes to the rate mentioned above. For reproducible results on any stock, the sealing pressure should be determined 30 minutes after indentation. A similar apparatus incorporating the features of this equipment is now being made by the Precision Scientific Company.

Fig. 21.

TABLE II—COMPARISON OF TEST RESULTS

Operator	I GR-S		II Neoprene		III Natural		IV Natural	
	BA	AA	BA	AA	BA	AA	BA	AA
A	55	20	85	48	77	66	69	42
B	54	5	86	58	79	65	70	44
C	51	14	81	49	77	68	66	38
D	51	14	86	38	83	72	71	44
E	54	..	90	54	77	68	71	45
F *	53.5	13.5	..	..	66	58	79	58

* "Referee Method." BA = Before Aging; AA = After Aging.

In order to test the method from the standpoint of consistency of the results among unskilled operators a number of tests were made. Samples of gasket material were cut from four different stocks and distributed to five employees of the Naval Research Laboratory who were totally unacquainted with the apparatus and the procedure for using it. They were furnished with four instruments and a copy of written instructions as to their use. Each held his results in confidence from the other until all tests were completed. Table II shows the results of each test together with those made at the Material Laboratory, Navy Yard, New York, using the so-called "referee" method. Since each operator was using the instrument for the first time, the results are indicative of what results should be expected from any other beginner. Closer checks are had as the operators accustom themselves to the technique.

It is evident that high sealing pressures can be obtained, in general, by compounding to give a hard stock. Since the force required to make the seal is roughly proportional to the hardness of the gasket, it may be expected that the air pressure needed to break this seal will also increase with the hardness. In the unaged stock this is generally true. However, the hardness must be limited to allow an easy closure of the watertight door or hatch. If the gasket is too hard the door or hatch may actually buckle before the proper sealing

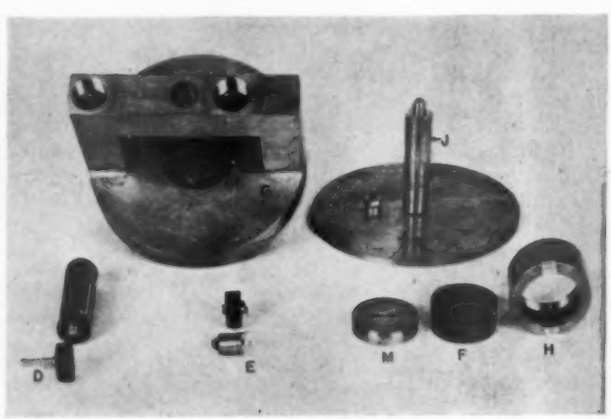

Fig. 22.

to the gasket is made. In addition, the force required to obtain a seal or close a hatch or door may be so great that the operator is unable to close the door properly. This feature was later subjected to extensive testing.

In addition to the seal aging test, therefore, the force required to indent must also be determined. This instrument is shown in Figs. 21, 22, and 23, and is designed to accompany the seal aging test apparatus, and provides a means of checking the force required to indent. It consists primarily of an indentor (J) of similar dimensions to the seal aging indentor, except that it is not threaded to a micrometer but has a smooth surface. The indentor is supported by the frame (G), being free to slide up and down onto the rubber sample (F). The distance of penetration into the rubber is regulated by setting the gap (C) by means of a thickness gage and the adjustable screw (B). The weights (K) are then placed on the plate (A) until the gap closes, turning on the electric light (E). (D) is a fine spring contact, which conducts the current from the battery which is enclosed in the frame (G) to the plate (A). For inspection purposes only one weight is needed for each gap thickness. If the material is sufficiently soft, the specified weight will suffice to turn the light on, otherwise the light remains off.

The procedure for the use of this instrument is as follows: The threaded base plate of the sample holder (M), Fig. 22, is removed and the sample (F) is inserted all the way into the sample holder (H). The threaded base plate is replaced and turned until it just touches the bottom of the rubber sample. It is important that the rubber is not compressed by turning the plate too far. It should be lightly turned on and off on the rubber several times, stopping at that point where the first light contact is felt. The sample holder is now placed in the proper receptacle of the indentation apparatus.

The thickness gage, 1/32 inch, is placed between the points of electrical contact (C) made by the screw from the plate and the insulated contact leading to the light. The thickness gage must be held level and flat. The set screw is turned with a small screw driver until the indentor (J) just barely makes contact with the rubber in the sample holder. This point can be determined by sighting through the slots in the top of the sample holder (H). The set screw is firmly held in position and locked with the lock nut. Once the gap of the electrical contacts has been thus set, the gap measuring

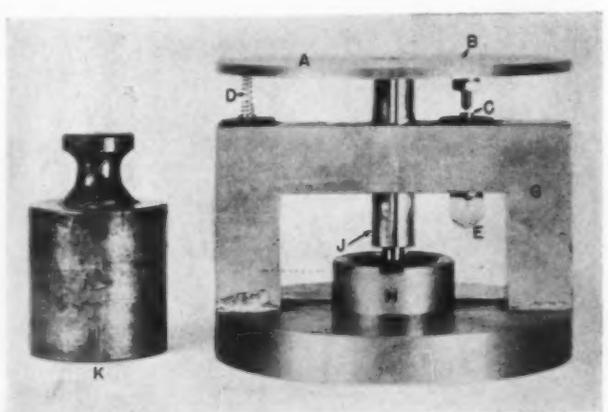

Fig. 23.

TABLE III—TORQUE READINGS ON GASKETS
(Expressed In Foot-Pounds)

Test No. Indentation	1	2	3	4	5	6	7	8	Mean
A—Natural Rubber [1]									
.025	3	2	2	2	2	2	..	..	2.2
.050	5	4	4	4	4	4	..	..	4.2
.075	10	10	10	10	10	10	..	..	10.0
.100	12	12	13	12	12	12	..	..	12.2
.125	15	14	15	15	15	15	..	..	14.8
.150	20	20	20	20	20	20	..	..	20.0
.175	25	23	24	24	23	22	..	..	23.5
.200	32	26	27	31	30	30	..	..	29.3
B—Natural Rubber [1]									
.025	2	2	2	2	2	2	..	..	2.0
.050	4	4	4	4	4	4	..	..	4.0
.075	7	8	6	6	8	6	..	..	6.8
.100	10	10	9	11	10	8	..	..	9.7
.125	12	13	12	12	13	12	..	..	12.3
.150	17	18	18	16	17	16	..	..	17.0
.175	21	21	20	20	20	20	..	..	20.3
.200	23	25	24	24	22	22	..	..	23.3
C—GR-M [2]									
.025	4	4	4	3	3	3	..	..	3.5
.050	6	5	6	5	6	5	..	..	5.5
.075	11	10	10	10	11	10	..	..	10.3
.100	12	11	11	11	12	12	..	..	11.5
.125	14	14	14	14	14	14	..	..	14.0
.150	20	20	20	20	20	20	..	..	20.0
.175	24	22	24	22	23	24	..	..	23.2
.200	32	31	31	30	30	31	..	..	30.8
D—GR-M [1]									
.025	2	2	2	2	2	2	2	2	2.0
.050	5	5	4	4	4	4	4	4	4.3
.075	8	8	8	8	8	8	8	8	8.0
.100	10	10	10	10	10	10	10	10	10.0
.125	12	13	13	13	13	14	14	13	13.1
.150	19	19	19	19	19	20	20	19	19.3
.175	20	22	20	21	21	22	22	21	21.1
.200	25	25	24	24	24	24	25	24	24.4
E—GR-M [2]									
.025	2	2	2	..	2	2	..	..	2.0
.050	5	5	5	5	5	5	..	..	5.0
.075	10	10	10	10	10	10	..	..	10.0
.100	12	13	13	13	13	13	..	..	12.9
.125	17	18	18	18	18	18	..	..	17.9
.150	21	20	20	21	20	20	..	..	20.3
.175	30	29	27	26	26	25	..	..	27.2
.200	40	39	39	38	37	36	..	..	38.2
F—GR-S [3]									
.025	4	4	4	4	4	4	..	..	4.0
.050	9	8	8	8	8	8	..	..	8.2
.075	13	12	12	11	13	12	..	..	12.2
.100	18	17	17	16	16	16	..	..	16.7
.125	21	20	21	20	21	20	..	..	20.5
.150	28	25	26	26	26	25	..	..	26.0
.175	36	32	33	32	31	31	..	..	32.5
.200	..	..	..	..	..	..	..	..	...
G—GR-S [2]									
.025	3	3	2	3	3	2	2	..	2.6
.050	6	6	6	6	6	6	6	..	6.0
.075	9	10	9	10	10	9	9	..	9.4
.100	13	14	13	13	13	13	13	..	13.1
.125	16	16	16	17	16	16	16	..	16.1
.150	21	21	20	21	21	21	21	..	20.9
.175	25	26	25	26	25	24	25	..	25.2
.200	32	35	32	32	32	33	34	..	32.9
H—GR-S [2]									
.025	2	2	2	2	2	2	2	2	2.0
.050	4	5	5	4	4	5	5	5	4.6
.075	9	9	8	9	8	8	8	8	8.4
.100	11	12	10	11	10	10	10	10	10.5
.125	16	17	15	15	15	16	16	16	15.8
.150	20	20	20	20	19	20	20	20	19.9
.175	25	26	24	24	23	24	24	24	24.3
.200	32	34	31	30	30	30	30	30	30.9
I—GR-S [2]									
.025	2	2	2	2	2	2	2	2	2.0
.050	5	5	5	5	5	5	5	5	5.0
.075	10	10	10	10	10	10	10	10	10.0
.100	14	13	13	13	14	14	13	13	13.4
.125	17	17	17	18	18	19	17	18	17.6
.150	22	21	21	21	22	22	22	21	21.5
.175	25	25	25	25	25	25	25	25	25.0
.200	32	32	32	32	32	32	32	32	32.0

[1] Edges of gasket not cut, torn, or abraded in removing gasket from channel of scuttle.
[2] Edges of gasket slightly torn and abraded in removing gasket.
[3] Edges of gasket badly cut and torn in removing gasket.

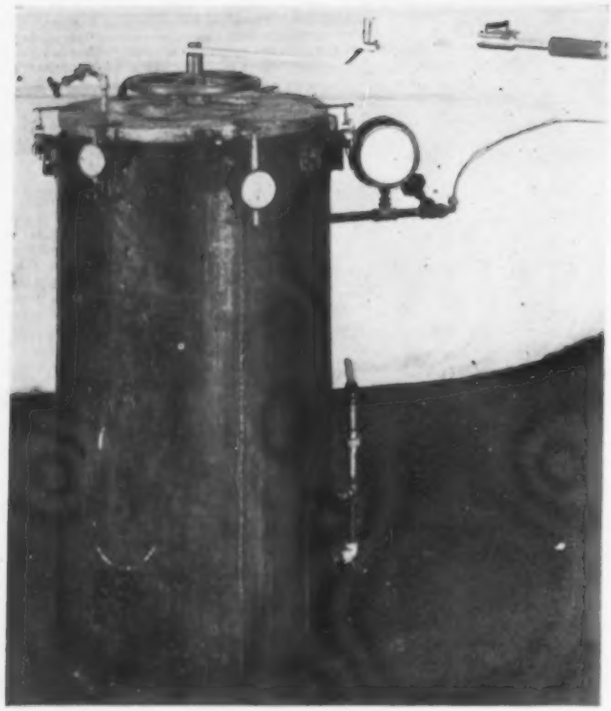

Fig. 24.

operation may be dispensed with in succeeding determinations, except for an occasional check to see that it has not changed. Caution should be exercised that the receptacle into which the sample holder fits is free from dust particles, dirt, water or other substances which might act as a shim. The presence of any such substances remaining under the sample holder will be reflected as an error in the gap width.

A small piece of sheet metal or plastic is placed over

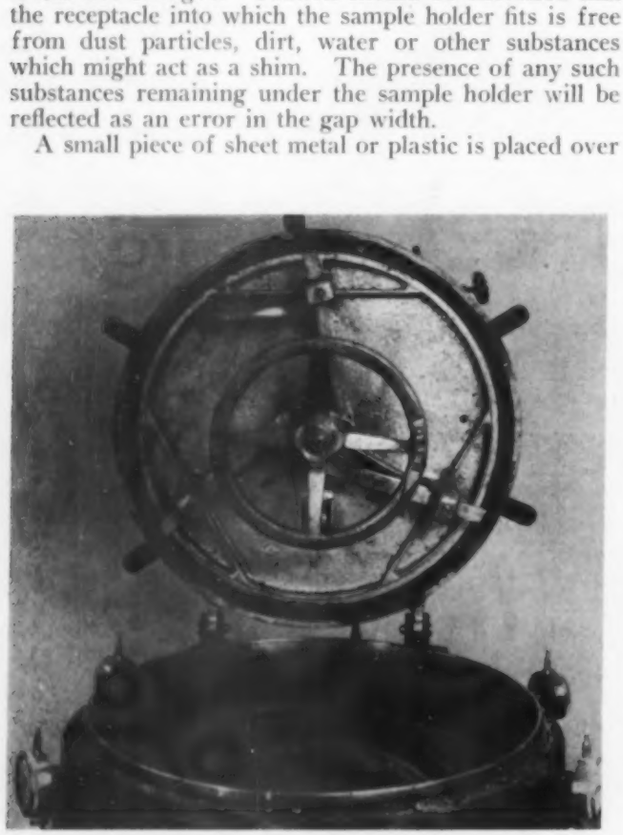

Fig. 25.

TABLE IV—HAND LOADING TESTS: FOOT-POUNDS TORQUE APPLIED MANUALLY THROUGH 10-INCH O.D. HANDWHEEL

	Overhead Mounting of Scuttle			Low Mounting of Scuttle		
Op.	Min.	Max.	Avg.	Min.	Max.	Avg.
1	44.0	50.0	46.0	58.0	64.0	60.0
2	30.0	40.0	38.0	40.0	52.0	46.4
3	34.0	46.0	40.0	46.0	60.0	53.2
4	32.0	40.0	36.4	52.0	60.0	55.6
5	32.0	36.0	33.2	50.0	56.0	53.2
6	40.0	40.0	40.0	44.0	58.0	52.8
7	44.0	52.0	48.4	48.0	60.0	53.8
8	38.0	46.0	41.2	44.0	52.0	46.8
9	28.0	34.0	30.8	40.0	56.0	48.4
10	36.0	38.0	37.2	60.0	70.0	64.8
11	34.0	40.0	38.0	54.0	58.0	56.0
12	44.0	50.0	47.2	48.0	58.0	52.8
Overall average			39.7			53.7

the sample holder so that the indentor shall rest on the metal or plastic rather than the rubber. Except during the actual test, the indentor should not rest on the sample to be tested as its weight might cause the rubber to flow. This is particularly true of some of the synthetics where an erroneous reading would otherwise be obtained.

The specified weight (K) is placed onto the weight plate. The metal or plastic cover is removed from the rubber and the weighted indentor allowed to rest on the rubber. If the light turns on within 5 seconds the sample is considered satisfactory. If the light remains off, it indicates that the sample is harder than required. Results are shown in Table VI.

Another feature of this apparatus is that it may be used to determine drift under deflection. Suppose that the sealing pressure has been determined as described above and it was found that the particular rubber sample is sealed to 90 pounds air pressure when the

Fig. 26.

TABLE V—SUMMARY DATA.

Stock No.	A[1]	B[1]	C[2]	D[2]	E[2]	F[3]	G[3]	H[3]	I[3]
Torque value at 0.125 in. indentation of coaming into gasket, ft. lbs.	14.8	12.3	14.0	13.1	17.9	20.5	16.1	15.8	17.6
Load per linear inch flange required to indent specimen 1/32 in., lbs.	5.1	5.9	8.0	4.3	5.3	15.9	8.4	7.2	7.1
Load per linear inch flange required to indent specimen 1/16 in., lbs.	11.7	13.5	17.4	9.9	11.9	26.4	18.1	16.3	15.9
Hardness (P. and J.) indentation, m.m.	1.53	2.07	1.63	2.08	1.59	0.97	1.53	1.58	1.57
Hardness, Shore "A" Durometer									
Instantaneous, points	40	29	39	34	44	60	46	43	43
After 15 sec., points	39	28	38	31	42	54	42	40.5	40
After 30 sec., points	39	28	37.5	30.5	41.5	52.5	41	40	39

[1] Natural Rubber Compound. [2] GR-M Compound. [3] GR-S Compound.

indentor has been inserted 1/32 of an inch. The pressure air is reduced to 25 pounds per square inch. The indentor is then slowly backed off until slight leakage occurs. In this manner it is possible to determine the "follow-up" of the rubber after it has been depressed and aged and evaluate the quality of the gasket. Numerous tests of this sort have been made on various types of synthetic rubber.

In connection with sealing tests, limiting hardness tests were conducted to determine the degree of hardness which could be tolerated. The apparatus used in the tests is shown in Figs. 24, 25, and 26. The coaming was 18 inches I. D., 1½ inch wide, ¼-inch thick, and had edges rounded to about ⅛-inch radius. The coaming was centered in the open end of a steel barrel and welded to an inner circumferential shelf ¾-inch wide, so as to allow the coaming to extend ¾-inch above the barrel. The scuttle was centered over the coaming, and six dial gages were mounted around the upper portion of the barrel so that the stems bore on reference plates of the coaming into the gasket in locations midway between and at each of the three dogs. The end of the shaft for the upper hand wheel was fitted with a square end nut to take a torque wrench, and the steel barrel and scuttle were drilled and tapped to take the necessary pipe fittings and accessory equipment for making hydrostatic or sealing tests.

The strip gaskets conforming to Bureau of Ships Specification 33R9 except as to hardness were inserted in the channel of the scuttle, and the dogs were adjusted to obtain indentation readings of 0.125 ± 0.002 inches at gage locations Nos. 2 and 6, with an indentation reading of 0.125 inch on gage No. 1. The gages were reset to zero after the dogs were disengaged. The torque wrench was then turned at a rate of about 5 revolutions per minute, and torque readings were taken for steps of 0.025 inch indentation of the gasket in the range from 0.025 inch to 0.200 inches. All indentation readings were made on gage No. 1 which was located at one of the dogs. The gasket was indented about 0.2 inches by four turns of the hand wheel, which was the limit of operation of the wheel. The test was repeated at least six times for each gasket. All tests to determine sealing pressure were made at 15 p.s.i. hydrostatic pressure under 0.125 inch indentation of the gasket. The results obtained are given in Tables III and V.

In addition hand loading tests were made using the apparatus shown in Fig. 26. Tests were made to determine the normal to maximum amount of torque applied by male personnel manually through the 10-inch O.D. handwheel of the scuttle. The scuttle was supported horizontally about 7 feet above floor level so that personnel participating in the test had to reach overhead to turn the lower hand wheel. However, the floor level was raised to suit the operator's convenience. The torque wrench was attached to the end of the shaft bearing the upper handwheel and secured at the grip to prevent the wrench from turning. Torque readings were taken while Laboratory personnel attempted to turn the lower handwheel. The above tests were repeated with the same personnel, except that the

TABLE VI

Material	Force Required to Indent 1/32-inch	1/16-inch	1/8-inch
A (GR-S)	7.2*		
	1.5†	4.3	9.0
B (Crude)	5.7*		
	1.3	3.3	7.0
C (GR-S)	6.5*		
	1.45	3.2	8.0
D (GR-M)	8.9*		
	2.10	5.9	16.2
E (GR-M)	2.85	8.8	7.18
F (Crude)	5.8*		
	1.35	3.0	7.6
G (GR-S)	7.2*		
	1.8	4.4	10.3
H (GR-S)	9.5*		
	2.4	5.3	9.6
I (GR-M)	6.5*		
	1.60	4.1	9.4
J (GR-S)	2.10	4.9	12.1
K (GR-M)	6.5*		
	1.5	3.3	8.1
L (GR-M)	10.0*		
	1.45	3.4	7.3
M (GR-M)	7.0*		
	1.5	3.8	7.9
N (Crude)	1.65	3.6	7.8

* Referee Method—Mat'l. Lab., Navy Yard, N. Y., results are expressed in pounds per linear inch of "knife edge" surface.
† Results with NRL apparatus are expressed in pounds to indent the spherical indentor and are in arbitrary units.

scuttle was mounted horizontally about 1 foot above floor level. The operator was allowed to stoop down or otherwise assume the most advantageous position while attempting to turn the upper handwheel. The results are tabulated in Table IV. These tests indicate that the eight pound limitation specified in Bureau of Ships Specification 33R9 *(8)*, using the "Referee Method", corresponds to practical results and should be adhered to closely.

A number of sealing and seal-aging testers have been developed and tested. For purposes of inspection and approval testing the Swenson Naval Research Laboratory seal aging tester and the indentometer have been found to be eminently satisfactory. Only a small amount of data has been presented in order to avoid having the subject matter and data unduly long. The progressive stages of development have been presented in some detail. Some of the equipment may be found of interest in developmental work where cost of equipment and simplicity of design are not of primary importance.

ACKNOWLEDGMENT

The extent of the investigation described above into the complex seal aging properties of synthetic and natural rubber particularly with medium soft gasket materials may be judged somewhat by the list of those who have contributed toward it. Nearly all manufacturers of gaskets of this type have at one time or another participated and many technologists in various laboratories have worked with the authors. The list of those who have actively participated and contributed especially includes: Norman C. Wiley and E. A. Buzkin, of the Bureau of Ships; John Lind, of the Material Laboratory, Navy Yard, New York; Felix Yerzley and V. A. Cosler, of E. I. du Pont de Nemours & Co.; Joseph Hollister and R. Harmon, of the Rubber Laboratory, Navy Yard, Mare Island; Lt. Shatterly, of the Naval Research Laboratory, Anacostia; W. L. Sturtevant, of the Manhattan Rubber Manufacturing Division of Raybestos-Manhattan, Inc.; Harry Frecker, Jr., of the U. S. Rubber Co.; H. Bashore, of the Precision Scientific Co.; Fred Thorn, of the Garlock Packing Co. and secretary of Sub-Committee 6 of A.S.T.M. Committee D-11 on Rubber Products; A. W. Carpenter, of the B. F. Goodrich Co., and L. V. Cooper, of the Firestone Tire & Rubber Co.

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Stress-Temperature Relations in Natural Rubber and GR-S

STRESS-TEMPERATURE relations in pure-gum vulcanizates of natural rubber and of GR-S have been studied by Lawrence A. Wood and Frank L. Roth of the Rubber Section of the National Bureau of Standards. Such studies yield information useful for calculations involved in the theory of elastic behavior, and furnish practical data regarding tensile properties at different temperatures. The results of the special study are set forth in two separate papers published in the November, 1944, issue of the *Journal of Applied Physics*.

In the case of natural rubber, the crystallization that occurs on stretching, at elongations exceeding 150 per cent, is a factor of considerable importance in explaining the results obtained. The compound contained 100 parts by weight of smoked sheet rubber, 2 parts of sulfur, 1 part of zinc oxide, and 0.5 part of zinc dibutyl dithiocarbamate (Butyl Zimate), and it was vulcanized 40 minutes at 115° C. The stress-temperature studies were made after the specimens were stretched and allowed to relax at a constant temperature of 25° or 70° C. for about 2 hours. The change of stress with time at the end of 2 hours was small enough to be without influence on later results, except when the flow was excessive or when the stretched rubber continued to crystallize, as it did at elongations between 150 and 500 percent at 25° C. At elongations of 150 percent and less, no evidences whatever of crystallization were found during the time of the experiments. At elongations of 500 per cent and more, the crystallization which occurred during stretching and in the first few minutes thereafter was so complete that the stress soon became independent of time. At 70° C. both the upper and lower limits of the range of elongations in which continued crystallization occurred were somewhat higher.

Crystallization was not a factor in the case of GR-S under any of the test conditions. Values of the stress after relaxation, for natural rubber and for GR-S, were used to plot stress-strain curves. In both cases, the stress-temperature relations obtained by lowering the temperature to about —20° C. were always linear and reproducible on successive runs of increasing and decreasing temperature, except when the flow was excessive or when the stretched natural rubber continued to crystallize. An additional period of relaxation was required if the rubber was heated above the temperature at which the first relaxation occurred. The slopes of the stress-temperature lines and the values of the stress at any temperature depended upon the temperature at which relaxation was carried out. The stress intercepts at 0° K are small compared with the total stress for elongations up to 150 percent. At the higher elongations the intercepts take on increasingly large negative values, finally becoming approximately equal in magnitude to the total stress.

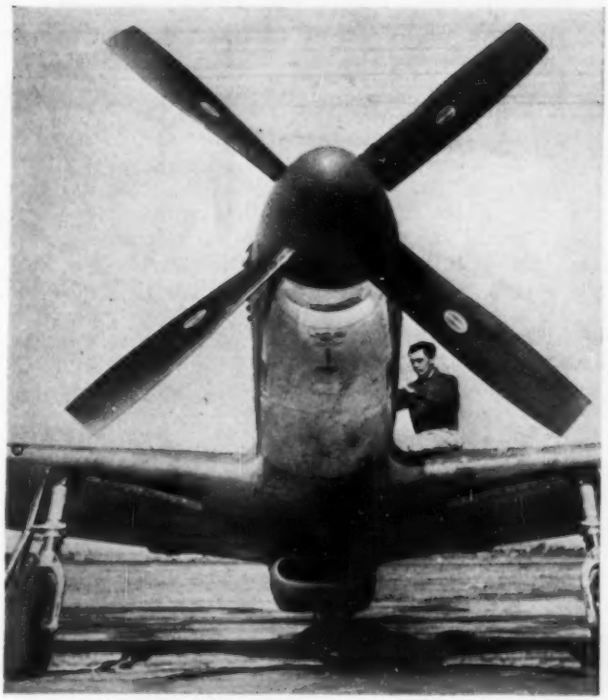
Cell-Tite Propeller Fairings

BY the addition of fairings to airplane propellers, more air is churned back onto the engine to obtain considerable decrease in engine temperature. The resulting increase in engine efficiency, it is said, may be directed to higher speed, rate of climb or ceiling, increased safety factor, heavier payload (more bombs or fuel), longer range, or any of several other desirable characteristics. Fairings, which are made of rubber, also increase the area of effectiveness of propeller blades, which means better plane performance at the same engine speed.

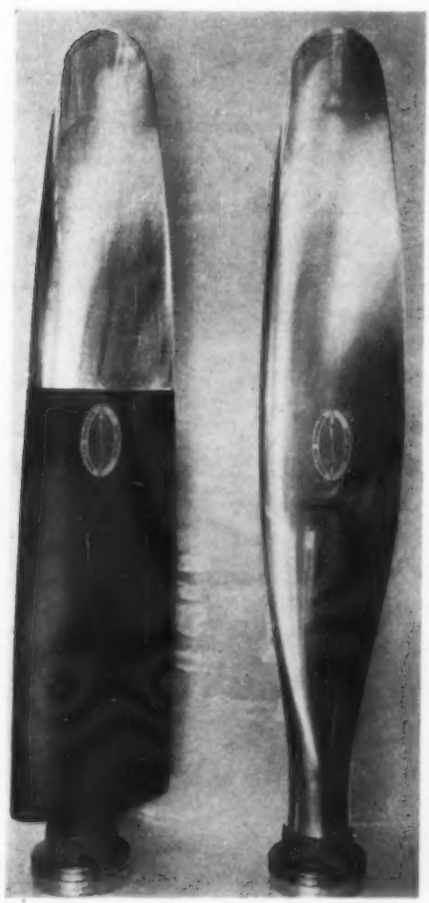
Unique Curing Method

The unique method designed by the Hamilton Standard Propellers Division of United Aircraft Corporation for curing propeller fairings, which makes use of a huge merry-go-round, forty feet in diameter, was described in the October, 1943, issue of RUBBER AGE. More recently, the Sponge Rubber Products Co., Derby, Conn., revealed that its Cell-Tite, the ebony-like cellular rubber material, is being used in the manufacture of these fairings.

According to its manufacturer, Cell-Tite has the best strength-weight ratio of any material ever produced commercially. Made in various weights, from 8 to 20 pounds per cubic foot, depending on the use to which it is to be put, it is filling many industrial needs. The Cell-Tite fairings affixed to Hamilton Standard Propellers (see accompanying illustration) weigh only 4 to 6 pounds. Other advantages claimed for the material include these: It has more buoyancy and lower water absorption than cork; it has excellent thermal, electrical and sound insulation qualities; it can be molded to almost any shape or form; it can be sawed, drilled, planed and otherwise worked much the same as wood; and it is practically impervious to water and weather as well as highly resistant to chemical attack.



View of a four-bladed Hamilton hydromatic propeller with cellular rubber fairings on a P-51 Mustang fighter, proclaimed the fastest airplane in existence.



The changed shape imparted by cellular rubber fairings in a propeller blade manufactured by Hamilton Standard for the P-51 Mustang is clearly seen in this illustration.

Termed Important Development

Getting back to the fairings, designers and engineers of North American Aviation, Inc., manufacturers of the P-51 Mustang (also illustrated), feel that the aerodynamic aid resulting from the use of propeller fairings of correct design and proper materials, represents one of the most important recent developments in airplane construction. The Mustang has been proclaimed the fastest airplane in existence, and set a record of 6 hours and 31½ minutes between Los Angeles and New York last year.

Improved Method of Placing Bands on Tire Building Machines

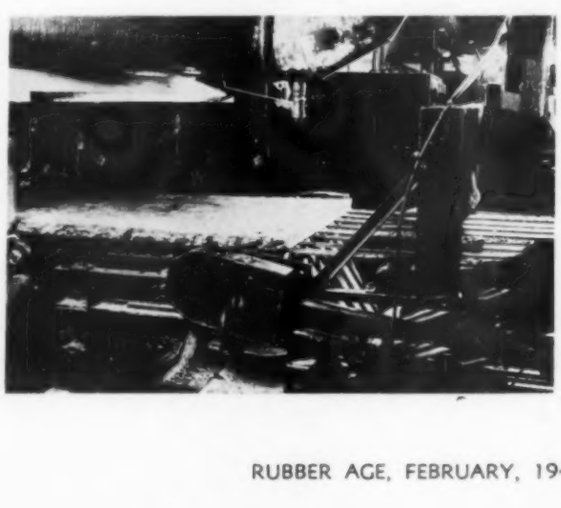
THE Olympic Tyre & Rubber Co., Melbourne, Australia, one of the leading tire manufacturers in Australia, have worked out an interesting system for putting tire bands in place on tire building machines without distortion of the bands. The accompanying illustrations clearly depict the method, which is described as follows: The band is placed over a collapsed expander, as will be noted below, to the required position. It is then expanded to the desired diameter, and a vacuum drum is then placed over the expanded band, the drum being suitably located. The band is further expanded until it contacts the vacuum drum itself and the ends of the band are folded back over the outside edges of the drum. Vacuum is then applied and the expander contracted sufficiently to permit easy withdrawal of both vacuum drum and band. In the final steps, the vacuum drum and band are placed in proper position over the tire building machine (above), the vacuum is released, and the edges of the band are unfolded from the drum. The drum is then removed, leaving the band correctly positioned on the tire building machine with no trace of distortion. Olympic Tyre has offered to furnish further details to tire manufacturers on request.

Test Report on Neoprene-Fiberglas Conveyor Belts

LONGER life for rubber-fabric conveyor belts subjected to severe operating conditions is said to be forecast by the performance of experimental neoprene-coated Fiberglas fabric belts made by B. F. Goodrich Company and tested on a factory conveyor line operating on a continuous 24-hour, 7-days-a-week schedule. Temperature of the material carried by the belts averages 300°F. The belts are subjected to considerable flexing and are exposed to contact with oil used in the binder of the material carried. Average life of rubber-covered cotton belts exposed to these conditions has been six weeks.

Eight neoprene-Fiberglas belts, three-sixteenths of an inch thick and 4 inches wide, were installed on the conveyor line. One belt was burned through by a piece of red-hot material after 3 months' service. A second belt failed at the end of six months because of extreme stress at a time of operating difficulty. At the end of 7 months' service, the other 6 belts are still performing efficiently. Because of the Fiberglas fabric's high resistance to elongation, adjustments to keep the belts in even tension have been practically nil.

In fabricating the neoprene-Fiberglas belts two inner plies and two outer plies of Fiberglas cloth, 36 inches wide, were given a thin coat of neoprene and then calendered to obtain the required thickness of coating. The coated, uncured plies were assembled; the neoprene cover was applied. The entire assembly was then press cured and cut to required lengths and widths.



Abstracts of United States Patents on the Compounding and Use of Synthetic Rubber

By FREDERICK MARCHIONNA, M. S. Chem.

Part XV

Nugent—U. S. Pat. 2,323,562—July 6, 1943. *Bonding Vinyl Resin to Leather.* (Assigned to B. B. Chemical Co., Boston, Mass.).

A composite shoe outsole or heel top lift consists of a backing leather layer and a tread surface layer of polyvinyl acetate, polyvinyl chloride, polyvinyl chloracetate, polyvinyl acetal, etc., plasticized with dibutyl cellosolve phthalate or dibutyl sebacate. The polyvinyl resin layer to be joined to the leather backing is roughened on the attaching face, and coated with a cement from an interpolymer of butadiene with acrylic nitrile, or the roughened face of the polyvinyl resin is coated first with a cement from a solution of chlorinated rubber, which is permitted to dry; a dispersion or a colloidal solution of butadiene-acrylic nitrile is then applied over the chlorinated rubber coating, and the leather layer is then pressed over the coated surface of the polyvinyl resin. In the example given, a 15 to 20% cement solution of chlorinated rubber is sprayed or spread over the roughened tread surface from a copolymer of 88% vinyl chloride and 12% vinyl acetate, the cement being dissolved in equal parts of methyl ethyl ketone and toluene. After this cement coating has dried and become tacky, a solution of the interpolymer of butadiene with acrylic nitrile is applied. Such solution may comprise 195 parts of butadiene-acrylic nitrile interpolymer, together with 39 parts of floated silica, 9.7 parts of zinc oxide, 200 parts of chlorinated rubber or polyvinyl chloride-acetate resin as toughener, 2.7 parts of stearic acid, and 3.6 parts of sulfur. Such mixture may be dissolved in a liquid containing 800 parts of toluol, 770 parts of methyl ethyl ketone, with or without 30 parts of hydrogenated rosin ester. When this coating is dried into a tacky condition, the leather backing is pressed thereon and vulcanized thereto into permanent bond.

Nugent—U. S. Pat. 2,323,563—July 6, 1943. *Bonding Vinyl Resin to Leather.* (Assigned to B. B. Chemical Co., Boston, Mass.).

A modification of U. S. Patent 2,323,562 for making composite soles or heel top lifts consisting of a backing layer of leather and a tread layer of polyvinyl resin. The modification consists in applying a cement coating of chlorinated rubber over the polyvinyl resin layer to be joined to the leather, drying this coating, and spreading a coating from a liquid dispersion or colloidal solution of a polychloroprene. A cement coating of the polychloroprene may be applied also to the surface of the leather to be joined and the coated surfaces then joined by heat and pressure. In the example given, a leather layer of outsole stock is roughened, and coated with a solution of a cement of polychloroprene; the polyvinyl resin from 88 parts of vinyl chloride and 12 parts of vinyl acetate is also roughened, given a coating from an adhesive solution of chlorinated rubber, dried and coated with a colloidal solution of plastic polychloroprene. The coated surfaces are then joined and consolidated by heat and pressure. The polychloroprene cement may comprise 900 parts of plastic polychloroprene containing 2% of phenyl beta-naphthylamine, 45 parts of rosin, 90 parts of magnesium oxide, 45 parts of zinc oxide, 9 parts of phenyl beta-naphthylamine as stabilizer, 27 parts of sulfur, and 12 parts of butyraldehyde-aniline condensate, dissolved in 1690 parts of benzene and 2850 parts of trichlorethylene. The outsole may be prepared as described, omitting only the polychloroprene coating around the marginal portion of the polyvinyl resin. Such a margin is then raised during the stitching of the outsole to the welt. A film of polychloroprene is then applied to the marginal portions of the outsole, whereby the vinyl resin layer is concealed, or the leather backing layer may be first stitched to the welt of the shoe. The vinyl resin layer is then coated with the chlorinated rubber cement, followed with a coating of polychloroprene, and then pressed into intimate contact with the laid sole in a Ballard pressing machine.

Spanel—U. S. Pat. 2,323,629—July 6, 1943. *Flexible Collapsible Container.* (Assigned to International Latex Corp., Dover, Del.).

Inflatable flexible and collapsible articles, such as toys, life-saving equipment, pontoons, canteens, etc., comprise a bladder formed of opposite walls of a thermoplastic material, such as Vinylite, vinyl butyral, Saran, ethyl cellulose glycollate, etc., whose adjacent marginal edges are fused together to form a seamless container. A reinforcing fabric strip is then extended over an edge of one of the fused seams and cemented thereto by means of a thermoplastic cement. This fabric strip is folded along respective longitudinal lines to provide V-sections which are disposed within the thermoplastic layers with the fabric fold lines positioned against the seam of the outer face of the V-strip which lies against and is cemented to the inner faces of the thermoplastic bag. Such a container is provided with a filling tube. This tube is preferably of rubber from latex and has a flange which is coated with a Buna N cement and joined to the top of the bag. A convenient way to make such a container is as follows: The thermoplastic bladder is formed by overlapping a sheet of the material, placing a fabric sheet at the junctures of the edges of the folded sheet, and applying heat and pressure to fuse the edges of the folded sheet, thus joining the fabric reinforcement permanently thereto.

Barton—U. S. Pat. 2,324,056—July 13, 1943. *Preserving Polybutadienes.* (Assigned to U. S. Rubber Co., New York, N. Y.).

A small quantity of an amino aryl dimethyl pyrrole—from 0.5 to 10%—when added to crude rubber or polychloroprene, polybutadiene, interpolymers of butadiene with crylic nitrile, etc., will preserve and stabilize the polymers and enhance their flexing qualities. Such preserving compounds include 1-(para-amino phenyl)-2, 5-dimethyl pyrrole; 1-(para-amino xenyl)-2, 5-dimethyl pyrrole; and 1-(ortho-dimethylamino phenyl)-2, 5-dimethyl pyrrole. In one example, 3 parts of 1-(ortho-

amino phenyl)-2, 5-dimethyl pyrrole are added to a composition consisting of the following parts: Buna N (100), a softener (16.5), carbon black (10), a soft carbon black (60), zinc oxide (5), sulfur (1.3), and an accelerator (0.75). Such a composition, when vulcanized for 40 minutes at a steam pressure of 40 lbs./sq. in., and bent in the form of a loop and exposed to atmospheric influence for two weeks, showed no cracks, while the control stock containing no cracking inhibitor developed large cracks under the same test conditions.

Kilbourne—U. S. Pat. 2,324,980—July 20, 1943. *Reclaiming Synthetic Rubber.* (Assigned to Firestone Tire & Rubber Co., Akron, Ohio.).

Synthetic rubber waste from polychloroprene or from butadiene-styrene and butadiene-acrylic nitrile interpolymers, etc., are reclaimed by heating the disintegrated waste at a temperature above 212° F. for less than 2 hours in the presence of a mixture of swelling agents from the group consisting of naphtha, asphalt, pine tar, medium process oils, rosin, coumarone resin, cotton seed oil, resin oil, etc. The following examples are given:

(I) About 100 parts of polychloroprene waste are ground to pass a 5-mesh sieve, mixed with 25 parts of crude solvent naphtha, and heated in open steam at 375° F. for one-half hour to recover a polychloroprene reclaim of good quality. The same polychloroprene ground waste may be mixed with 5% of rosin, 15 parts of Paraflux, and 10 parts of naphtha, and heated in open steam at 375° F. for one hour, after which it is subjected to vacuum of 20 inches for two hours to remove any volatile solvent. This reclaim is milled for 10 minutes, refined twice, strained through a 20-mesh screen, and used to replace uncured neoprene in a standard mix.

(II) A waste material from an interpolymer of butadiene with acrylic nitrile containing a large quantity of carbon black is ground, mixed with 20% of Paraflux, 10 parts of coumarone-indene resin, and 10 parts of naphtha, and heated at 375° F. for one hour in open steam to obtain a good reclaim.

(III) Old tire tread stock of butadiene-styrene interpolymer is ground on a mill to pass a 5-mesh sieve, mixed with 10% of Paraflux, 5 parts of rosin, and 50 parts of naphtha, and heated in open steam at 485° F. for 15 minutes to obtain a reclaim having good tack.

Mertens—U. S. Pat. 2,325,531—July 27, 1943. *Hardened Polyolefine Coatings.* (Vested in Alien Property Custodian, Washington, D. C.).

When polyisobutylene or interpolymers of a monolefine with a small quantity of a diolefine is hardened by interpolymerization with a mixture of 55 parts of styrene and 1 part of divinyl benzol, it can be softened by kneading or milling and thereby rendered easily soluble in toluene or xylene to form a solution particularly suitable for coating wire, etc. Thus, condenser electrodes are provided with a dielectric coating by interpolymerizing the polyolefine with a mixture of styrene-divinyl benzol, using 40 parts olefine polymers and 60 parts polymerizable mixture, thereby obtaining a hardened interpolymer. This interpolymer is masticated to render it soluble and dissolved in a suitable solvent to form a solution. The solution is applied to the electrode surface to form a smooth uniform dielectric coating, from which the solvent is evaporated. An additional coating from a polystyrene or polyvinyl carbazole may be applied to form a hard protective layer.

Garvey—U. S. Pat. 2,325,946—Aug. 3, 1943. *Plasticized Butadiene Interpolymers.* (Assigned to B. F. Goodrich Co., Akron, Ohio).

Di-2-ethyl hexyl phthalate is used for the plastification of polybutadiene, polyisoprene, polypiperyline, polychloroprene, or interpolymers of butadiene with acrylic nitrile, styrene, vinyl benzene, isobutylene, methyl methacrylate, methyl ethyl ketone, methyl vinyl ether, vinylidene chloride, etc. Thus, an interpolymer from 55 parts of butadiene and 45 parts of acrylic nitrile is milled with 50% of the di-2-ethyl hexyl phthalate at 120° to 130° F. and then compounded with pigments, sulfur, accelerator, etc. The resulting plasticized composition has, however, only a slight tackiness but when painted with a solvent, such as acetone, ethyl acetate, methyl ethyl ketone, chloroform, chlorotoluene, isopropyl chloride, etc., the stock will be satisfactorily tacky. The interpolymer in the above example may be from a mixture of 75 parts of butadiene and 25 parts of acrylic nitrile or methyl methacrylate.

Garvey—U. S. Pat. 2,325,947—Aug. 3, 1943. *Plasticized Butadiene Interpolymers.* (Assigned to B. F. Goodrich Co., Akron, Ohio.).

Interpolymers of butadiene with styrene, vinyl naphthalene, acrylic acid nitrile, acrylic acid amide, alkyl acrylates and methacrylates, methacrylamide, methacrylonitrile, isobutylene, vinylidene chloride, methyl vinyl ether, methyl isopropenyl ketone, etc., can be plasticized by incorporating therewith from 5 to 50% of an amide of long chain fatty acids containing from 10 to 20 carbon atoms. Such plasticizers include lauramide, oleamide, N, N-dimethyl stearamide or lauramide, N, N-diethyl stearamide, N, N-diisopropyl myristamide, N, N-dicyclohexyl stearamide, N, N-dibutyl palmitamide, N-cyclopentyl lauramide, N-cyclohexyl oleamide, N-methyl lauramide, N-ethyl stearamide, N-phenyl oleamide, N-benzyl stearamide, N-phenyl stearamide, N-paratolyl lauramide (lauryl para-toluide), N-hydroxyethyl lauramide, N-beta-ethoxyethyl myristamide, etc. In one example, 20 parts of N, N-dimethyl amide, containing mainly N, N-dimethyl stearamide and palmitamide, are incorporated in 100 parts of an interpolymer from the emulsion polymerization of 55 parts of butadiene and 45 parts of acrylic nitrile. By milling the mixture there is obtained a fairly soft and tacky batch. In another example, 10 parts of N, N-diethyl stearamide are milled in an interpolymer from 75 parts of butadiene and 25 parts of styrene to produce a very soft stock.

Garvey—U. S. Pat. 2,325,948—August 3, 1943. *Plasticized Butadiene Interpolymers.* (Assigned to B. F. Goodrich Co., Akron, Ohio).

The tetrahydrofurfuryl esters of polycarboxylic acids are good softeners for polybutadiene, polypiperyline, etc., or for interpolymers of butadiene with styrene, vinyl naphthalene, alpha-methylene, methyl acrylate, methyl methacrylate, metacrylo nitrile, isobutylene, vinylidene chloride, etc. The esters used may be the oxalate, malonate, succinate, glutarate, adipate, pimelate, suberate, sebacate, azelate, etc., of tetrahydrofurfuryl. One of the hydrogen atoms of the dicarboxylic group may be replaced with ethyl, propyl, amyl, benzyl, cyclohexyl, ethoxyethyl, etc., to obtain mixed esters. The polycarboxylic acid may be the aconitic, tricarballylic, trimellitic acid, etc., which can form either the mono-, di-, or tri-esters of tetrahydrofurfuryl. In one example, 50 parts of di-tetrahydrofurfuryl sebacate are incorporated in 100 parts of an interpolymer from 55 parts of butadiene and 45 parts of acrylic nitrile to obtain a stock of good plasticity which will develop a fair tackiness when wetted with acetone, ethylacetate, chlorotoluene, methyl ethyl ketone, etc. Such softener will not leach out of the vulcanizate even when immersed for 48 hours in hexane. In the above example, the plasticizer may consist of 50 parts of di-tetrahydrofurfuryl azelate. In another example, 50 parts of di-tetrahydrofurfuryl phthalate are incorporated in 100 parts of an interpolymer from 75 parts of butadiene and 25 parts of acrylic nitrile by milling for 8 minutes; or 10 parts of di-tetrahydrofurfuryl sebacate are used for softening 100 parts of an interpolymer from 75 parts of butadiene and 25 parts of styrene.

Sarbach—U. S. Pat. 2,325,979—Aug. 3, 1943. *Plasticized Butadiene Interpolymers.* (Assigned to B. F. Goodrich Co., Akron, Ohio).

Polymers of butadiene, isoprene, piperylene, chloroprene, or interpolymers thereof with styrene, vinyl benzene, isobutylene, methyl methacrylate, acrylic nitrile, methyl vinyl ketone, vinylidene chloride, methyl vinyl ether, etc., are plasticized with a softener having the formula

$$\begin{matrix} R_1-O-(R_2-O)_n \\ R_1-O-(R_2-O)_n \\ R_1-O-(R_2-O)_n \end{matrix} \!\!>\!\!- P=O$$

in which R_1 and R_2 may be methyl, ethyl, isopropyl, butyl, allyl, benzyl, cyclohexyl, phenyl, tolyl, xenyl, naphthyl, etc. An interpolymer from 55 parts of butadiene and 45 parts of acrylic nitrile may be plasticized by milling with 50% of tributoxyethyl phosphate, or with equal weights of the softener and the interpolymer. Other specific softeners may be tri-butoxyethyl phosphate, tri-ethoxyethyl phosphate, tri-methoxyethyl phosphate, tri-ethoxypropyl phosphate, tri-phenoxyethyl phosphate, tri-butoxyethoxyethyl phosphate, etc.

Sarbach—U. S. Pat. 2,325,980—Aug. 3, 1943. *Plastacized Butadiene Interpolymers.* (Assigned to B. F. Goodrich Co., Akron, Ohio).

The plastification of butadiene interpolymers with acrylic nitrile is effected by adding to the interpolymers, in solid form or as a latex, from 10 to 50% of di-1-methyl heptyl phthalate. Thus, when 50% of this phthalate plasticizer is added to an interpolymer from 55 parts of butadiene and 45 parts of acrylic nitrile, the Goodrich plasticity with a 10 lb. weight at 100° C. is about 79.6. But when equal amounts of di-butyl phthalate, di-amyl phthalate, and di-ethyl hexyl phthalate are similarly incorporated in the interpolymer, the comparative plasticities are found to be 16.4, 43.8 and 55.3, respectively. The interpolymer to be softened may be from 75 parts of butadiene and 25 parts of acrylic nitrile, or from 67 parts of butadiene and 33 parts of acrylic nitrile.

Sarbach—U. S. Pat. 2,325,981—Aug. 3, 1943. *Plasticized Butadiene Interpolymers.* (Assigned to B. F. Goodrich Co., Akron, Ohio).

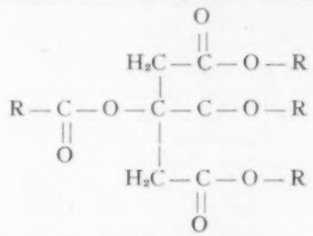
A resinous material obtained from cashew nut shell oil is found to be an excellent softener for interpolymers from 55 parts of butadiene and 45 parts of acrylic nitrile. The cashew nut shell oil resins are sold commercially as "Cardolite 816," "Cardolite 869," "Cardolite 707," and "Cardolite 708." When 50 parts of "Cardolite 816" are incorporated in 100 parts of a 55:45 emulsion interpolymerization of butadiene and acrylic nitrile, there is obtained in a short time a smooth, plastic and tacky stock by milling only for six minutes. Such stock may be plied to a natural rubber stock by brushing the plasticized interpolymer stock with ethyl acetate, acetone, methyl ethyl ketone, etc., and plying it with the rubber. Compounded with sufficient sulfur and hexamethylene tetramine as accelerator, there will be obtained synthetic ebonite vulcanizates which are highly resistant to oils. The quantity of Cardolite added to the interpolymer may vary from 10 to 50% and even up to 100%.

Sarbach—U. S. Pat. 2,325,982—Aug. 3, 1943. *Plasticized Butadiene Interpolymers.* (Assigned to B. F. Goodrich Co., Akron, Ohio).

Interpolymers of butadiene or other conjugate diolefines with styrene, vinyl naphthalene, acrylic acid, methyl acrylate or methacrylate, acrylic nitrile, methacrylic nitrile, methacrylamide, isobutylene, methyl vinyl ketone, methyl vinyl ether, vinylidene chloride, etc., can be plasticized by the addition of .1 to 100 parts, or preferably 10 to 60 parts, of a chlorinated tri-aryl phosphate having from 5 to 50% chlorine as a softener. Such softeners include chlorinated triphenyl phosphate, chlorinated tri-cresyl phosphate, chlorinated tri-xylyl phosphate, chlorinated tri-mesityl phosphate, chlorinated tri-naphthyl phosphate, orthochloro phenyl diphenyl phosphate, orthochloro phenyl dinaphthyl phosphate, di-(2, 4-dichlorophenyl)-orthocresyl phosphate, etc. In one example, an interpolymer from 55:45 emulsion polymerization of butadiene and acrylic nitrile is milled at 120° F. to 130° F. and 50 parts of tri-(2-methyl-4-chlorophenyl)-phosphate, or tri-(2, 4-dimethyl-3-chlorophenyl)-phosphate, etc., are added as fast as the softener is absorbed by the polymer, thus obtaining a fair soft batch yielding vulcanizates having tensile strength of 500 lbs./sq. in. or more. An interpolymer of butadiene with styrene can be well plasticized with about 10% of chlorinated tricresyl phosphate.

Sarbach—U. S. Pat. 2,325,983—Aug. 3, 1943. *Plasticized Butadiene Interpolymers.* (Assigned to B. F. Goodrich Co., Akron, Ohio).

Polydiolefine polymers, or interpolymers of butadiene, isoprene, dimethyl butadiene, piperylene, etc., with styrene, vinyl naphthalene, acrylic acid, acrylic nitrile, methyl acrylate or methacrylate, isobutylene, methacrylic nitrile, methacrylamide, methyl vinyl ketone, methyl vinyl ether, vinylidene chloride, etc., can be plasticized with a compound having the formula



in which R is an alkyl group containing 1 to 8 carbon atoms. Such plasticizers include acetyl trimethyl citrate, acetyl triethyl citrate, acetyl tripropyl citrate, acetyl tributyl citrate, acetyl triamyl citrate, acetyl tri-2-ethylhexyl citrate, propionyl tributyl citrate, butyryl triamyl citrate, acetyl methyl dibutyl citrate, acetyl ethyl propyl butyl citrate, etc. The amount of softener may be from 1 to 100% but it is preferred to use from 10 to 60%, calculated on the weight of the polybutadiene. In the example given, an interpolymer from the 55:45 emulsion polymerization of butadiene and acrylic nitrile is milled at 120° to 130° F., and 50% of acetyl tributyl citrate added as fast as the softener is absorbed to produce a soft stock, which when vulcanized remains flexible even at —35° C.

Sarbach—U. S. Pat. 2,325,984—Aug. 3, 1943. *Polybutadiene Cements.* (Assigned to B. F. Goodrich Co., Akron, Ohio).

Cements from interpolymers of butadiene with acrylic nitrile which will be highly stable and will have strong adhesive power are produced by treating the solid polymer with a small quantity of an acid, such as acetic, trichloracetic, or benzoic acids, or preferably a mineral acid, *e.g.*, sulfuric or hydrochloric acid. Although the higher fatty acids, such as stearic or lauric acid, etc., could be used, they are not very effective for the purpose. In one example, an interpolymer from a 55:45 emulsion polymerization of butadiene and acrylic nitrile is coagulated by the addition of alum which forms an insoluble aluminum soap and causes precipitation of the latex in the form of crumbs 2 to 4 mm. in size. The insoluble soap is washed out from the crumbs by washing with a solution of sodium hydroxide. This precipitate is milled with 10% of a 10% aqueous solution of acetic acid and then dissolved in chlorobenzene to form a 10% solution which has low viscosity and does not gel on standing for 6 days. A non-gelling cement from a polychloroprene may be obtained by treating the polymer with a 0.2% trichloracetic acid, or benzoic acid, or with a 0.1 to 5% solution of sulfuric or hydrochloric acid. Acidified water is added to the solution cement of the polymers or interpolymers of butadiene or to the solid crumby precipitate to impart to the products a pH from 4 to 6.

Semon—U. S. Pat. 2,325,985—Aug. 3, 1943. *Plasticized Butadiene Interpolymers.* (Assigned to B. F. Goodrich Co., Akron, Ohio).

Esters of boric acid with alcohols having from 4 to 8 carbon atoms are used as effective plasticizers for polydiolefines, or interpolymers of butadiene with styrene, vinyl naphthalene, acrylic acid, methyl acrylate or methacrylate, acrylic nitrile, methacrylic nitrile, methacrylamide, isobutylene, methyl vinyl ether, methyl vinyl ketone, vinylidene chloride, etc. From 10 to 50 parts of this softener will give soft, tacky stocks. Such plasticizers include the borates of 2-methyl-1, 3-propanediol, 2, 2-dimethyl-1, 3-propanediol, 1, 2-, 1, 3-, or 1, 4-butanediol, 2, 3-methyl pentanediol, 1, 6-hexanediol, 2, 2-dimethyl-3, 4-hexanediol, 1, 2-octanediol, and pinacol (2, 3-dimethyl-2, 3-butanediol). Esters of boric acid with glycerol, erythrytol, dulcetol, mannitol, etc., and even tributyl borate, tribenzyl borate, etc., can be used. For example, 50 parts of 1, 3-butanediol borate

are milled into a 55:45 interpolymer of butadiene and acrylic nitrile to obtain a fairly plastic, soft stock. About 10% of such a plasticizer will be effective to render plastic and tacky the butadiene-styrene polymer.

Conrad—U. S. Pat. 2,326,927—Aug. 17, 1943. *Processing Polybutadienes.* (Vested in Alien Property Custodian, Washington, D. C.).

Polybutadiene, or interpolymers of diolefines with other polymerizable compounds, etc., is rendered more amenable to compounding and processing by working the solid polymer on a milling machine having at least three rolls, with a frictional area between the first and the second rolls and a second frictional area between the second and third rolls. These rolls are run at high peripheral speed, which may be between 80 to 180 r.p.m., and should have diameters not exceeding 0.5 meter. The friction of the frictional area between the first and the second rolls is less than that between the second and the third rolls. The friction of the first area is reduced to such an extent that the machine at this point acts as a mixer, while the friction of the second area is such that the machine acts as a refiner. The second and third rolls of the machine operate at different speeds, the faster roll having a speed greater than 100 r.p.m., *e.g.*, 100 to 180 r.p.m.

Mack and Morse—U. S. Pat. 2,326,955—Aug. 17, 1943. *Coated Foil.* (Assigned to Reynolds Research Corp., Richmond, Va.).

Non-annealed foils of aluminum, zinc, or alloys thereof, are laminated with cellulose acetate or other cellulose esters or ethers by means of an intermediate cement layer of a polyisobutylene which may contain small quantities of a diolefine. The metal foil may be 0.005 to 0.002 inch thick; the polyolefine cement layer may have a thickness of 0.001 to 0.005 inch; while the cellulose derivative may be 0.007 inch thick.

Frolich and Bannon—U. S. Pat. 2,327,517—Aug. 24, 1943. *Chlorinated Polyolefines.* (Assigned to Jasco, Inc., New York, N. Y.).

The chlorination of long chain polyolefines is effected by dissolving the polymer in a solvent inert toward chlorine, adding to the resulting solution a discoloration-preventing substance and a stabilizer, and passing chlorine through to effect the desired degree of chlorination. The stabilizer may be acetic, propionic, oxalic, stearic acid, etc., or amino and chloro derivatives thereof, such as amino acetic acid, amino propionic acid, monochloracetic acid, di- or tri-chloracetic acid, alpha chloropropionic acid, etc. The long chain olefinic polymer to be chlorinated may be a polyisobutylene, a polydiolefine, or an interpolymer of a mono with a diolefine obtained at —10° to —150° C. with boron trifluoride as catalyst or similar Friedel-Crafts type catalyst. Whichever polymer is employed, it is dissolved in carbon tetrachloride, hexachlorethane, difluoromethane, etc., to form 5 to 10% solutions. From about 0.5 to 5% of the above stabilizers, or amylamine, butylamine, propylamine, methyl aniline, ethanolamine, etc., is added to the solution and the latter then placed in a glass, or nickel-lined reactor, and chlorine gas passed through from the bottom of the reactor in the dark until there is effected a chlorination of the desired degree. From 10 to 100 volumes of alcohol or acetone are agitated in the reacted solution to precipitate the chlorinated polymer; or the chlorinated polymer solution is treated with boiling water or steam so as to remove the solvent.

Dickson—U. S. Pat. 2,327,625—Aug. 24, 1943. *Heat-Resistant Articles.*

Mitts, gloves, shoes, aprons, etc., which are to be used for the handling of hot instruments and equipment, such as machine gun barrels, helmets for fighting fires, oil well fires, etc., are rendered resistant to heat by coating the article with a polychloroprene. Thus, mitts and gloves for handling hot objects are made of soft leather or textile fabric, preferably of asbestos cloth having interstices which allow for free circulation of air. The palm and inside finger portions of the mitt or glove are coated with a polychloroprene, preferably in the form of latex, by brushing in such a way so that the coating will not permeate into the fabric but will merely cover the outside of those parts which are most subjected to handling and heat, thereby forming a waterproof and heat-resistant article which is cured at 250° F.

Harrison—U. S. Pat. 2,327,638—Aug. 24, 1943. *Elastic Rubber-Like Tubes.* (Assigned to Harrison & Morton Labs., Inc., Akron, Ohio).

In a method and apparatus for making tubings from natural rubber and/or polychloroprene, the apparatus consists of a latex tank and a rotatable shaft disposed horizontally below the latex level. This shaft is provided on its periphery with a plurality of grooves which are concentric with the shaft. Another similar shaft is set above the first shaft, parallel thereto. A flexible elastic mandrel is assembled over the two shafts to pass progressively in the two sets of grooves from one end to the other end of the shafts, thus the two shafts are surrounded by a pseudo-helicoidally, elastic mandrel. In the production of tubings from this machine, the elastic mandrel is passed through the latex to form a deposit of the required thickness and, without any coagulant treatment, is passed around a sheave immersed in the latex and then removed. This depositing process is repeated until there is produced a tube of the required thickness. While the formed tube is still on the mandrel, it is passed over a support to cause a change in its direction of travel and then led under a sheave lying in a plane parallel to the sheave in the latex bath. The operation may be repeated. The mandrel is kept in stretched condition throughout the various steps. When the tubing to be made is for transporting gasoline or other oils, the mandrel may be dipped first in a latex from chloroprene to form an oil-proof deposit of the required thickness and then in natural latex, whereby the tube formed will have an interior layer of neoprene and an exterior layer of natural rubber.

Zaucker—U. S. Pat. 2,327,975—Aug. 24, 1943. *Plasticized Polybutadienes.* (Vested in Alien Property Custodian, Washington, D. C.).

The plasticity of butadiene polymers and interpolymers is improved by incorporating therewith a small quantity of an amino compound, such as dimethylaniline, 2-dimethylamine naphthalene, 2-phenylamino naphthalene, 4-tolyl-1-naphthylamine, 2, 7-naphthylene diamine, 2, 2-dinaphthylamine, 1, 4-dibeta naphthylamino benzene, etc., together with a non-volatile saturated aliphatic or cycloaliphatic carboxylic acid, or salts thereof. These carboxylic acids include lauric, stearic, montanic, cyclohexyl, dihydroxy stearic, saturated naphthenic acids, etc. To illustrate, a 75:25 interpolymer of butadiene and styrene, which has been stabilized with 3% of phenyl beta-naphthylamine, added during polymerization, is mixed with about 2% of a salt of the carboxylic acid, crumbed, and the crumbed mass then treated with compressed air for approximately 100 minutes at a pressure of 3.5 atmospheres and at a temperature of about 130° C., whereby the polymer becomes plastic and soluble in benzene. The following table shows the solubility of the polymer after such treatment as measured by viscosity in centipoise of 4% benzene solution (the polymer being insoluble in benzene without any addition of carboxylic acid):

Montanic acid	102.
Stearic acid	25.8
Fatty acids by oxidation of paraffine	38.5
Cyclohexane carboxylic acid	19.0
Naphthenic acid (saturated)	14.1
Sodium stearate	80.2
Potassium stearate	71.6
Magnesium stearate	114.3
Calcium stearate	110.9
Aluminum stearate	77.2

Interpolymers from a 75:25 emulsion of butadiene and styrene containing 3% of phenyl-beta-naphthylamine are mixed with 2% of purified montanic acid dissolved in aqueous sodium hydroxide, coagulated, crumbed and heated at 130° C. with compressed air for 70 mins. to obtain a workable plastic mass.

(To Be Continued)

Editorials . . . . . .

Washington Conference

ONE definite inference which can be drawn from the parleys held in Washington during the latter part of January by American, British and Dutch rubber experts is that some control over rubber supplies and distribution must be continued for at least two years after the end of global warfare. Although no specific plans could be advanced at the conferences because of the great number of "unknowns" involved in the over-all situation, particularly as to the actual status of the crude rubber plantations in the Far East, the delegates were in general agreement that the pent up demand for finished rubber products all over the world will absorb all of the crude and synthetic production which can be managed.

Since it is reasonable to assume such a condition for an extended period after the war, equitable distribution of the available supply of both crude and synthetic rubber among the United Nations calls for continued regulation and control. The Combined Raw Materials Board, which now governs such allocation, could continue such control, but in the event this Board should cease to function after the war, and there is some agitation in that direction currently afoot, then the United States, Great Britain and the Netherlands would be obliged to set up a new international body, probably fashioned after the former International Rubber Regulation Committee, with temporary allocation powers.

The time element is, of course, one of the most important parts of the consideration of world rubber supply. For instance, if it takes more than two years to restore the Far Eastern plantations to full productive capacity, then the period of filling the pent up demand for industrial and consumer goods may be spread out over a wider time area than two years. If a sharp increase in the use of rubber is recorded due to new developments, then the time when a rubber surplus would be evident would be pushed back several years. How long it will actually take to restore the plantations in Malaya, Sumatra, and other heavy rubber-producing areas to full capacity is pure speculation. One authority, F. B. Davis, Jr., chairman of the board of the U. S. Rubber Co., has set it at five years.

That a surplus situation in rubber will eventually be reached is a foregone conclusion. The figures which developed as a result of the Washington conference indicate a surplus of 1,300,000 tons annually. This amount is based on 1,500,000-ton production of natural rubber plus present world capacity of more than 1,300,000 tons of synthetic, and presumes that world consumption of rubber will reach 1,500,000 tons annually in the post-war era, almost 50% greater than pre-war consumption. Even allowing for consumption to reach the staggering figure of 2,000,000 tons annually, there would still be a surplus problem involving some 800,000 tons of rubber.

From time to time these columns have urged the necessity of formulating a strong international organization to control the production, distribution and price of rubber. The inevitability of a surplus situation within a few years after the end of the war is still another urgent reason for such an organization. If things are allowed to take their normal course, then a price war between producers of natural rubber and synthetic rubber will eventually develop. Whether or not the price of crude will ever drop as low as three cents again is not important. What is important is that price wars mean fluctuating prices and nothing drives a rubber manufacturer to despair more quickly than price fluctuations, especially in wide ranges. Remember when there were 250 tire manufacturers?

We are in agreement that there are too many factors involved in the over-all rubber situation, particularly the problems posed by the synthetic rubber manufacturing industry created as a war-time emergency, to permit the immediate formulation of an international organization with powers of production, distribution and price. But we repeat that the time to discuss such an organization is now.

CURRENT NEWS OF THE MONTH

15 NEW TIRE PROJECTS APPROVED BY WPB AS EMERGENCY PROGRAM SWINGS INTO GEAR

THE emergency heavy-duty tire program designed to meet the huge demand of the Army, first announced by the War Production Board on December 13, is swinging into high gear. Top-rate priorities on machinery, equipment and manpower are being provided where necessary to guarantee fulfillment of the ambitious program. In the meantime, the labor situation in the tire factories is improving steadily and the production of heavy-duty tires is stepping up satisfactorily. There seems to be little doubt that the rubber manufacturing industry will furnish all of the tires, and other rubber products, necessary to maintain the full tempo of what is apparently a mounting Allied offensive against the gates of Europe, as well as the invasion tactics aimed at the Japanese Empire.

At this writing (February 10), a total of 15 projects in the new heavy truck tire program has been officially announced by the War Production Board. The projects are divided into two sharply defined programs. The first of these is the so-called "within walls" program, which was planned prior to the latest emergency, and the second is the new program designed to furnish facilities for the production of an additional 6,000,000 truck tires per year. The latter program will cost approximately $70,000,000 and will add about 25% to the nation's total tire production capacity.

In making various announcements concerning the 15 projects, WPB emphasized that in many cases funds authorized are not the total estimated expenditures but are partial authorizations made so that orders may be placed promptly for certain urgent items of equipment in order not to delay initial operations. When all of the plant facilities are completed and fully manned some time early in 1946, it is estimated that heavy tire output will reach 28,000,000 units per year. Production of these units in 1944 ran slightly higher than 14,000,000.

New Expansion Program

Projects approved to date as part of the 6,000,000 truck-tires-per-year expansion program include the following:

Gadsden, Alabama—To be operated by Goodyear. $2,000,000 allocated for new buildings adjacent to present factory and for additional facilities. Estimated annual production, 288,000 truck tires and 288,000 tubes. Initial production, June, 1945.

Topeka, Kansas—To be operated by Goodyear. $4,250,000 allocated for new buildings adjacent to present factory and for additional facilities. Estimated annual production, 373,700 truck tires and 373,700 tubes. Initial production, August, 1945. Total allocation to date, $10,400,000.

Tuscaloosa, Alabama—To be operated by Goodrich. $18,000,000 allocated for new factory. Estimated annual production, 600,000 truck tires, 300,000 tubes and 600,000 flaps. Initial production, September, 1945.

Nashville, Tennessee—To be operated by Goodyear. $10,000,000 allocated (approximating total estimated expenditure) for new factory. Estimated annual production, 370,000 truck tires, 370,000 tubes, 1,440,000 flaps and 360,000 bogies. Initial production, August, 1945.

Pottstown, Pennsylvania—To be operated by Firestone. $7,000,000 allocated for equipment. Estimated annual production, 900,000 truck tires, 2,160,000 tubes, 1,800,000 flaps, 300,000 bogies and 300,000 air bags. Initial production, April, 1945. (Mention of this project was announced in our previous issue. It represents a new factory insofar as tire building is concerned but was formerly operated for the manufacture of aircraft engines by the Jacobs Aircraft Company and title to land and buildings was already vested in D.P.C.).

Dayton, Ohio—To be operated by Dayton Rubber. $400,000 allocated for building additions, wings and additional facilities. Estimated annual production, 150,000 truck tires and 150,000 tubes. Initial production, May, 1945.

Houston, Texas—To be operated by Kelly-Springfield. $6,000,000 (approximating total estimated expenditure) allocated for new factory.

Oakland, California—To be operated by Pacific Tire & Rubber. $1,000,000 allocated for building additions, wings and additional equipment. Estimated annual production, 216,000 truck tires. Initial production, May, 1945.

Bowdon, Georgia—To be operated by Textile Rubber, Inc. $250,000 (approximating total estimated expenditure) allocated for new wings and additional facilities. Estimated annual production, 1,000,000 flaps and air bags. Initial production, April, 1945. (This project is still undergoing technical studies that may alter plans for carrying it out.

"Within Walls" Projects

Of the 15 projects approved to date, six of them fall into the "within walls" category. A list of these follows:

Memphis, Tennessee—To be operated by Firestone. $250,000 (approximating total estimated expenditure) for additional facilities. Estimated annual production, 28,000 truck tires. Initial production, May, 1945.

Akron, Ohio—To be operated by Firestone. $1,000,000 allocated for additional facilities. Estimated annual production, 180,000 truck tires. Initial production, May, 1945.

Akron, Ohio—To be operated by Goodyear. $500,000 (approximating total estimated expenditure) for additional facilities. Estimated annual production, 144,000 truck tires. Initial production, May, 1945.

Conshohocken, Pennsylvania—To be operated by Lee Rubber. $600,000 for building additions, wings and additional facilities. Estimated annual production, 136,000 truck tires and 120,000 tubes. Initial production, June, 1945.

Des Moines, Iowa—To be operated by Lake Shore Tire. $775,000 allocated for building additions, wings and additional facilities. Estimated annual production, 496,000 truck tires. Initial production, May, 1945.

Gadsden, Alabama—To be operated by Goodyear. $225,000 (included in the $2,000,000 authorized under the new 6,000,000 truck-tire-per-year program) for additional machinery. Estimated annual production from this phase of the expansion, 252,000 truck tires. Initial production, April, 1945.

Rubber Bureau Moves

All divisions and sections of the Rubber Bureau of the War Production Board have been moved from the New Municipal Center Building to the Social Security Building, Independence Avenue, between 3rd and 4th Streets, S.W., Washington, D. C. The new offices are on the first floor at the Third Street end of the building. James F. Clark, director of the Rubber Bureau, occupies Room 1208.

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All Plants Owned by DPC

All of the 15 listed projects will be owned by the Defense Plant Corporation but all actual operations will be handled by the tire companies named. It will be noted that the majority of the new truck tire projects have been located adjacent to present tire factories. In some instances, production of rubber goods other than tires has been shifted to other locations in order to expand tire production at so-called "company headquarters." While quick production has been the major consideration in approving each project, availability of manpower was cleared with WMC before approval in each case.

In addition to the projects listed, it is understood that the Robbins Tire & Rubber Company has received an authorization of $500,000 to proceed with construction of an additional building and expansion of present buildings at its Tuscaloosa, Alabama, plant and for procurement of new equipment. This authorization was granted to permit the company to get started on its expansion but further grants will probably be made. The new Tuscaloosa facilities are expected to provide an additional 1,200,000 large size tubes per year and initial production is scheduled for May, 1945.

Additional Information Released

Some of the major companies involved in the new tire projects have released some preliminary information relative to some of the new plants. Goodyear, for instance, has stated that the increase at its Topeka plant will provide an additional manufacturing area of 100 x 900 feet and will include a two-story building to be used for materials storage. When in full operation, total employment at this plant will amount to 850. The Gadsden plant will have a new wing measuring 560 x 250 feet, which will add 300 workers to the payroll. The new Nashville plant will be of one-story construction, will measure 1000 x 400 feet, and will employ approximately 1,000.

According to Goodrich, the new plant at Tuscaloosa will be one of the largest units in the tire program and the main factory building will be 1200 feet long and 300 feet wide. It is also understood that Lee Rubber is negotiating for a new DPC tire factory somewhere in the mid-West.

European Plants Will Help

The current need for heavy-duty tires at various battle fronts, particularly in the European theatre of operations, is expected to be relieved somewhat by restoration of tire factories in France and Belgium. Reference has already been made in a previous issue to the speed with which one Belgian tire factory was supplied with synthetic rubber, carbon black and the necessary rubber compounding ingredients, practically all of which were shipped by air. According to the War Department, the small shipment of materials received enabled the Belgian workmen to learn the technique of using American materials and to make highly critical repair materials, as well as tires for Allied mechanized units. The shipment kept the factory in operation until larger quantities arrived, thus preventing a scattering of skilled workmen.

In connection with the same statement, the War Department revealed that an indication of the tire shortage on the European front is given by the fact that there are more than 100,000 repairable tires at the two principal tire repair centers in France. These tires cannot be repaired because of the lack of camelback and other repair materials which must come from the United States. Each of these centers is capable of turning out approximately 2,000 reconditioned tires weekly but they are operating at about one-quarter capacity because of the repair material shortages.

According to a statement released in Washington on February 2 by Colonel Lawrence Wilkinson, who is described as "the chairman of the Allied Rubber Control Committee in Paris," the Army is already in high gear on a sweeping tire production program in both France and Belgium. He said that plants in these countries are already turning out tires and tubes in "amazing numbers" and added that Allied plans envisage the gradual utilization of "the entire tire manufacturing capacity of northwestern Europe." He also said that the French in particular were showing keen aptitude under the guidance of United States tire technicians and that all available French tire facilities "will be in full operation within six weeks."

It has also been reported that negotiations have been concluded with Swiss industrialists under which the Firestone tire plant in Basle, Switzerland, will immediately resume "standardized" production of heavy-duty tires. Under the agreement, the Allied Forces will authorize transit through France for necessary raw materials. No confirmation of this report, however, was made by the War Department.

Labor Situation Improves

The labor situation in the tire plants has improved considerably in recent weeks and although actual production figures have not been disclosed by WPB, it is believed that military tire production has increased by approximately 25% in the last two months. James F. Clark, Director of the WPB Rubber Bureau, issued a statement on February 5 to the effect that as a result of the drive to obtain sufficient manpower for peak operation of all facilities producing heavy-duty tires, a net gain of 3,614 workers has been achieved since last November. He added that a need remains for 2,322 workers to be filled within the next three or four weeks, and if furloughed soldiers have to be replaced, 1,500 more men must be found. Mr. Clark's full statement on the present manpower situation in the heavy tire plants follows:

"On November 25, 1944, 5,936 additional employees still were needed to man all existing facilities fully on a three-shift basis. Five thousand of these workers had to be men capable of performing heavy and strenuous work. As of January 20, 1945, the total needs for additional manpower had been reduced to 2,322 additional employees; some 1,450 men and 872 women are still needed. These figures show a net gain in employment of 3,614. But 1,500 of this net gain is represented by soldiers furloughed for 90 days by the Army. These furloughs will have to be extended or the drive must be continued to hire men to take their places.

"During the nine-week period commencing November 18, 1944, and ending January 20, 1945, truck and bus tire production showed an increase commensurate with the increase in manpower.

"A marked decrease in absenteeism during the period has taken place. In November, absenteeism in the tire industry was high, averaging as much as 12 per cent in some factories. Today, current reports reveal that absenteeism has been reduced to 6 per cent. This highly creditable improvement has taken place even though the seven-day work week has been invoked for the industry. This shows more than any other factor that employees fully realize the present urgent need of the armed forces for tires. It is proof that the workers and management alike have heeded General Eisenhower's call for more tires as quickly as possible.

"Credit for securing the gain in employment is undoubtedly due to good teamwork. The War Manpower Commission, the field offices of WPB, the U. S. Employment Service, the War Department, the Navy Department and the Rubber Bureau, WPB, have all worked together to accomplish this result. The heavy duty tire production team of the Army Service Forces has been most helpful. A representative of this team has been assigned to each tire manufacturing company. The work of the team and the individual officers assigned to plants has produced excellent results.

"During the nine-week period, U. S. Employment Service has referred 10,564 men to the truck tire manufacturing industry. 7,888 men and women have been hired during the period. To this figure must be added 1,500 furloughed soldiers, when the gross hires are considered. However, there have been 5,774 separations from the industry during the period, or a net gain of 3,614 persons, including the 1,500 furloughed soldiers. Recent reports indicate that the Navy Department is taking steps to furlough about 150 sailors not now assigned to the fleet or who have not been specially trained by the Navy, but who have had previous experience in heavy-duty tire building.

"The task of fully manning existing facilities has got off to a good start, but this is no time to relax in the all-out effort to continue the manpower drive. 2,322 people are needed within the next four weeks and, if furloughed soldiers have to be replaced, 1,500 more men must be found.

"Today's figures are the current needs including the men and women who will have to be hired to man additional facilities in the 'within-existing-walls' tire expansion program. However, they do not include manpower needed for manning new tire plants."—End of statement.

Miscellaneous Labor Activities

The Goodyear Tire & Rubber Company was cleared on January 20 of charges previously made by C. V. Wheeler, president of the Goodyear Local of the U.R.W.A., to the effect that the company could produce at least 5,000 more tires daily in one of its Akron plants with better material supply and scheduling.

Colonel Kenneth D. Johnson, chief of the Army's Special Truck Tire Manpower Project Team in Akron, which conducted the investigation, reported that "every reasonable step is being taken by Goodyear to attain peak truck tire capacity in Plant 2 (the plant involved in the charges), which on the basis of evidence presented is considered to be from 3 to 8% in excess of current output. Increase to such a maximum is predicated on substantially reduced absenteeism, avoidance of slowdowns and self-imposed work stoppages, minimum mechanical difficulties, and optimum scheduling with special efforts continuously directed toward the closest cooperation and coordination on the part of both labor and management."

The report declared that Mr. Wheeler's charges were completely unfounded and Col. Johnson stated that in the future his office would not make similar investigations "without proper certification from the office of the international headquarters of the union when such an investigation is necessary and desirable." Both the company and the union were criticized for failure to explore fully and reconcile completely differences of opinion on production matters. Mr. Wheeler was leaving for Europe for a tour of the battlefronts just as the report was made and stated that he would make a reply to it on his return.

In answer to recent charges that service men furloughed from the Army to work in tire plants were being required to join labor unions, the U.R.W.A. stated on January 12 that the executive board of the union has adopted a policy "whereby any soldier released to build tires may join the union if he so desires but is not required to do so even in plants where maintenance of membership is part of the union contract." The statement said that many of the furloughed soldiers expressed a desire to join the union and in such cases their applications were accepted and initiation fees and assessments waived.

In the meantime, the status of the union workers in the Detroit plant of the U. S. Rubber Co. is still confused. Despite the "no strike" pledge of the union, a group of workers conducted an outlaw strike at this plant several months ago. They were fined $12.50 each by the international organization but 572 workers refused to pay the fine.

In an unprecedented action, the National War Labor Board on January 17 ordered the U. S. Rubber Company to deduct the fines from the wages of the union members involved, in addition to checking off delinquent dues and reinstatement fees where necessary to return those fined to good standing in the union. It was the first time that the Board had ever ordered an employer to check off fines levied by a union against members for violation of the "no strike" pledge. The Board's action represented the unanimous decision of its members.

As a result of the unprecedented action, the United Automobile Workers (A.F. of L.) threatened court action to prevent the deduction of the $12.50 fines. A telegram addressed by the U.A.W. to U. S. Rubber asserted that "a majority of the employees are members of the United Automobile Workers and as such are no longer affected by fines, regulations and orders by the United Rubber Workers." If the fines are deducted, according to U.A.W. officials, immediate action will be taken against U. S. Rubber for illegal wage deduction in violation of State and Federal laws.

It has also been learned that officials of the U.R.W.A. will shortly plead their case in Washington for higher wages in an attempt to help break the formula which now holds wage increases to within 15% of the January, 1941, level. An industry-wide wage bill has already been filed with the National War Labor Board asking for a 12c general wage increase, a 10c hourly night bonus, paid lunch periods, and liberalized vacation schedules.

TWO ADDITIONAL DIRECTIONS TO RUBBER ORDER ISSUED BY WPB

Two additional directions to Rubber Order R-1 have been issued by WPB in recent weeks, as follows:

Direction 9, issued on January 6, specifies that notwithstanding the provisions of List 30, Appendix II, to Rubber Order R-1, as amended November 9, 1944, until March 31, 1945, no Grade A camelback or capping stock may be manufactured in crown widths of less than 5¼ inches and in depth gauge of less than 14/32nds of an inch, including cushion gum, except to fill government orders. The same direction specifies that the manufacture of wing-type die sizes shall be permitted only to fill government orders or for use in retreading off-the-road tires.

Direction 11, issued on January 16, prohibits the purchase and consumption of polyisobutylene (Polybutene, Vistanex and Synthetic 100) for experimental purposes. Appeals from this direction can be made with the Appeals Unit, Rubber Bureau, WPB, Washington, D. C.

(EDITOR'S NOTE: The regulation permitting the use of Butyl rubber in the manufacture of certain tubes for light trucks after January 15, designated as Direction 9 in our January, 1945 issue, was actually Direction 10).

Other government regulations pertaining to the rubber manufacturing industry issued in recent weeks included the following:

RUBBER BANDS

Dollar-and-cent ceiling prices for rubber bands made of Buna S have been established in Amendment No. 18 to M.P.R. 220 (Certain Rubber Commodities), issued by OPA on February 12 and effective February 17. The ceilings, effective February 17, 1945, are at the general levels prevailing during the first quarter of 1942.

One table of ceilings is established for manufacturers and wholesalers. It is customary for wholesalers to sell from manufacturers' price lists. Another table of ceilings applies to dealers, including stationery stores and other retailers.

The table for manufacturers and wholesalers applies to 17 standard sizes of rubber bands. Simple rules are provided to calculate the ceiling prices for other sizes, using this same table. Different ceilings are listed, depending on volume of purchase. The lowest ceilings are for purchases of 500 pounds and over, with highest ceilings set for the smallest volume purchases. Seven package sizes are listed.

The table for dealers, including retailers, applies to all sizes of bands. The ceilings depend on size of package and volume of purchase. The dealer ceilings on purchases of one to four pounds range from $1.50 to $2.50 per pound. On purchases of 500 pounds and over, the ceilings range from 89 cents to $1.26 a pound. Four package sizes are listed.

To take care of small retail sales, provisions are inserted that the ceiling per quarter-pound box is 50 cents when the sale is for less than one pound, and the ceiling per 1-ounce box is 20 cents when the sale is for less than one pound.

RUBBERIZED APRONS

Ceiling prices have been established on new rubberized aprons made for the U. S. Army Medical Corps and currently being sold for civilian use. Covered in Order 20 under Supplementary Order 94,

the ceilings, effective January 25, are: On sales by the Procurement Division of the Treasury Department, f.o.b. point of shipment to jobber or wholesaler, 80c per apron; on all sales to retailers, f.o.b. point of shipment, $1.15 per apron; on all sales to consumers, $1.90 per apron.

The aprons are described as 36 inches long, 33 inches wide, and 10 inches across the bib, with tie strings and neck band of brown tape. Approximately 10,000 of these aprons have been turned over to Treasury Procurement for civilian use.

The Army said that the aprons were bought for special uses, such as laboratory work in medical training courses and interest and experiments conducted by the Army. An oversupply of the aprons resulted from a reduction in training activities, plus the fact that the aprons have proved to be of longer life and durability than predicted. The factor of deterioration has required that the Army dispose of stocks on hand above its needs.

SURGEONS' RUBBER GLOVES

New surgeons' rubber gloves sold by the Procurement Division of the Treasury Department for civilian use were given maximum prices by OPA on February 9. The ceilings are incorporated in Order 25 to Supplementary Order 94 (Special Maximum Prices for Sales of Surgeons' Rubber Gloves).

Ceiling prices for these gloves, which are of a superior quality, are as follows: for sales by Treasury Procurement to wholesalers, 21 cents a pair, f.o.b. shipping point; for sales by Treasury Procurement and wholesalers to retailers, 28 cents a pair, f.o.b. shipping point; and for sales by retailers 49 cents a pair.

The surplus gloves priced were made for the Army Medical Corps. They are being sold for use by medical supply houses, hospitals and for other civilian uses, the Army said, because they might deterioriate if kept too long.

The action provides that any person selling these gloves to retailers is required to furnish the retailer with an invoice stating the maximum retail price. The retailer is required to tag each pair of gloves with his ceiling price before he sells it.

COTTON TIRE CORD

Adjustable pricing for most sales of cotton tire cord and cotton tire cord fabric by "independent" manufacturers to rubber tire manufacturers was authorized by OPA on February 6 with the issuance of Order No. 48 under 19a of the General Maximum Price Regulation. The order, which followed upon the heels of the industry's request for higher ceiling prices, is intended to permit continued deliveries of these essential goods while OPA studies the request for price adjustments.

The action does not apply to sales of tire cord or fabric for use in tires bought by war procurement agencies. These products are covered, not by the General Maximum Price Regulation, but by a separate regulation on textiles for military purposes. A producer who can ascertain that the tire cord or fabric is to be bought ultimately by a war agency, may apply to OPA for permission to enter into contracts with adjustable pricing clauses.

The application for price adjustments was made through the industry advisory committee representing "independent" cotton tire cord manufacturers. The order applies only to "independent" producers, as distinguished from subsidiaries or affiliates of rubber tire manufacturers. If any price increases are granted, the order permits "independent" manufacturers to charge the difference between present prices and the revised prices.

TIRES AND TUBES

Ceiling prices granted individual manufacturers since May, 1944, on new original equipment tires and tubes will apply to any other manufacturers making the same tires and tubes, according to Amendment No. 3 to R.M.P.R. 119 (Original Equipment Tires and Tubes), issued by OPA on January 26 and effective January 31. The ceilings are thus extended by listing the ceilings, which were originally given by letters of authorization, in the original regulation.

At the same time, the ceiling prices for original equipment agricultural tires and tubes have been revised in a number of instances to bring about a more equitable relationship between various sizes.

MISCELLANEOUS ORDERS

Minimum prices for women's overshoes made of neoprene latex by the So-Lo Works, Inc., Loveland, Ohio, have been established under Order 26 under the General Maximum Price Regulation. Maximum price for department stores was set at 87c a pair and for chain stores 77c a pair. The prices cover nonmolded, heel strap type women's overshoes made from neoprene latex, vulcanized and cured in one solid piece, with all edges reinforced by extra thickness beading.

Portable milking machines may now be made with rubber tires less than 2¼ inches in cross section, under Amendment No. 3 to Limitation Order L-257 (Farm Machinery).

Under the terms of an amendment to Conservation Order M-286 (Pulp and Paper), glassine paper may now be used as a substitute for Holland cloth in the backing of retreading stocks for tires, tire reliners, patches and sandblast stencils, and as a wrapping on friction and rubber tape. Previously, only vegetable parchment was permitted.

In an amendment to Priorities Regulation 3, issued on January 9, WPB specified that hard rubber drums (among other items) may no longer be acquired with the assistance of blanket maintenance, repair and operating supplies ratings. A further change in this regulation changes the phrase "tire retreading, recapping and repair equipment except for recapping or repair of truck tires 8.25 by 20 and larger" to the following phrase: "Tire retreading, recapping and repair equipment including full circle and sectional air bags."

SUPPLY AND CONSUMPTION PROBLEMS DISCUSSED AT MEETING

Another meeting of rubber experts of the United States, United Kingdom and the Netherlands was held in Washington the week of January 22. The meeting actually consisted of a number of conferences, with major discussion centered on problems of supply and consumption in the post-war period.

According to a summary of the meeting issued by the Department of State on January 29, world production of rubber, both synthetic and natural, will rise in the first few years after the war to almost twice the estimated demand in consuming countries. It was predicted, however, that a marked upward trend in consumption would develop as the result of wider markets and new uses for rubber and that these two factors would ultimately solve the overproduction problem.

Because of the number of "unknowns" concerning production and consumption, the delegates were unable to arrive at any definite conclusions as to costs and prices, but it was generally agreed that production of crude rubber could rise in three or four years after liberation of the Far Eastern territories to an annual figure of 1,500,000 long tons. Synthetic rubber capacity, it was estimated, would reach 1,333,000 tons. World consumption of both natural and synthetic rubber in the post-war era was set at 1,500,000 tons only.

Since eventual production of crude and synthetic rubber will reach an estimated annual total of 2,833,000 tons and world consumption will total only 1,500,000 tons, the statement pointed out "that a marked disequilibrium between the world capacity and demands would develop in the course of a few years," but added that "the group is hopeful that an expanding world economy will lead to greater per capita consumption and that new uses for rubber will be accelerated by advances scientists have made in developing new physical and chemical characteristics in rubber and rubber-like materials."

The official statement also pointed out that the time element is an important part of the consideration of the world

rubber situation. If it takes more than two years to bring the plantations up to full capacity, the period of filling the pent-up demand may be spread over a long period. If total world consumption should increase quickly after the "catch-up" period ends, the time of arrival of a rubber surplus might be set back several more years.

Price Element Mentioned

Referring to the competitive angle, the statement pointed out that as long as the world is able to use the products of both plantation and synthetic rubber plants, the predicted price competition of the two products would not develop into a price war. The report was fairly optimistic on the possibilities of avoiding the excessive competition which resulted in such wide price fluctuations in crude rubber in previous years, this view being based on the belief that with the rising world living standards and new uses for rubber, consumption might jump rapidly a few years after the war. No reference was made in the statement with regard to possible measures that might be taken to maintain synthetic rubber production once natural rubber is again freely available.

The cautiously-worded statement issued by the Department of State represents the only official statement issued in connection with the Washington meeting. However, it was learned on good authority that the international experts are in agreement that the pent-up demand for rubber goods will take all the available natural and synthetic rubber for at least two years after the plantations in the Far East are returned to their British and Dutch owners and that there will be a sharp expansion in world consumption after this pent-up demand is filled because of the new uses for rubber which have been developed.

Restoration of Plantations

It has also been learned that plans have been drawn up for the restoration of plantations in the Far East as soon as Allied forces obtain a foothold in crude rubber areas now occupied by the Japanese. Military strategy is, of course, an unknown factor, but it is reasonable to assume that Borneo may be the next step in the Pacific, with an invasion of Sumatra a likely possibility. Although no definite information is available, reports reaching official quarters indicate that many of the small factories which engaged in the initial processing of crude rubber in Sumatra, Malaya, and other rubber areas have been destroyed by the Japanese and will have to be restored. In addition, it is reasonable to assume that quantities of simple but essential equipment will have to be provided, as well as textiles and other necessities for the native workers.

One disturbing report which is receiving some circulation in official quarters is that the Japanese may have awarded land grants to natives on property owned by American, British and Dutch interests. If this is the case, local problems will develop once the areas are liberated but they will represent more of a "nuisance" problem than a major one.

One implication of the Washington discussions is that the world supply of rubber will probably have to remain under allocation by an international supply board of some kind for two or three years after the end of the war. This implication is drawn from the fact that world demand for rubber in the first few years following the close of the war will substantially exceed combined crude and synthetic production, and in order to ensure equitable distribution of the available supply among all of the United Nations the Combined Raw Materials Board may have to continue its wartime allocation practices. Should this Board cease to function at the end of the war, then some new international board with allocation powers will probably have to be organized.

RFC Issues Report

Just prior to the meeting of the rubber experts in Washington, the Reconstruction Finance Corporation issued a report (on January 16) that including the rubber trade, rubber imports into the United States since early 1940 to the present have been more than 2,280,000 long tons. Imports of crude rubber handled by the Rubber Reserve Co., an RFC subsidiary, including 83,000 tons purchased from the Commodity Credit Corporation, amounted to 930,000 long tons, of which 116,000 tons were received during 1944. The report also stated that from June, 1942, to January, 1944, during which Rubber Reserve was the sole buyer and seller of scrap rubber in this country, it purchased a little more than 1,000,000 short tons, of which 920,000 tons have already been sold.

Pointing out that more than $700,000,000 have been invested in plants and facilities for the manufacture of synthetic rubber, the report stated that production of synthetic has been approximately 1,000,000 long tons, of which 737,000 tons were produced in 1944. These plants are capable of producing at least 1,000,000 long tons of synthetic rubber a year if necessary. Mention was made of the fact that 47 chemical, petroleum, rubber and industrial companies operate the plants for the account of Rubber Reserve.

In addition to the production of synthetic rubber, according to the RFC report, the plants involved in the program have produced more than 25,000,000 gallons of ethylbenzene and approximately 4,000,000 gallons of cumene, which is used in the manufacture of aviation gasoline.

Referring to cost, the report pointed out that prior to the war natural rubber was selling in the United States for 18 to 20c per pound and that synthetic rubber is being produced in some of our plants at less than these figures. Synthetic rubber cost for 1944, the report stated, exclusive of plant amortization, was approximately 33c per pound due to the fact that more than 60% of the butadiene was made from high-priced alcohol instead of petroleum.

Wallace Clarifies Position

Henry Wallace, former vice-president, named by President Roosevelt as Secretary of Commerce to succeed Jesse Jones, clarified his position on the synthetic rubber plants on January 25 during a hearing before members of the Senate Commerce Committee in connection with that appointment. He made it clear that his policy as Secretary of Commerce would be to close down the synthetic rubber plants if their continued operation was dependent on a high tariff on crude rubber imports. He said that he was not in favor of abandoning all synthetic rubber plants if that would endanger national security and added that he was in favor of continuing synthetic rubber production with a tariff on natural rubber if cheaper and better rubber could be secured by such a policy.

Defending his statements on the rubber situation which appeared in an article in the *New York Times* about a year and one-half ago, and which aroused quite a furore at the time, Mr. Wallace stated that "I think it regrettable to put a tariff on rubber just to keep the synthetic rubber industry going." Aided by questions raised by Sen. Pepper (Fla.), Mr. Wallace pointed out that he had favored rubber preparedness prior to Pearl Harbor whereas other administrators, including Jesse Jones, had not given the "green light" to the synthetic rubber program until after crude supplies were actually cut off. He also made mention of the fact that early in 1940 he had urged Edward S. Stettinius, now Secretary of State, to recommend the construction of synthetic rubber facilities.

Brazil Denies Argentine Deal

According to a statement issued on January 27 by Valentin F. Boucas, Brazilian head of the Washington Mission on Raw Materials, there is no truth to the report that Brazil is negotiating a rubber agreement with Argentina. Any agreement to supply rubber to that country, he added, must be negotiated between Argentina and the United States.

Mr. Boucas also stated that every effort is being made to close all channels and prevent the smuggling of crude rubber or tires from Brazil to Argentina. Maritime police recently seized 800 tires being transferred to a ship bound from Brazil to Argentina, he said.

Indicative of the shortage of rubber which prevails in Argentina today is a government decree issued at Buenos Aires on January 27 prohibiting sale of tires and tubes to private automobile owners, including public employees. The decree was obviously issued in an effort to conserve Argentina's depleted rubber stocks for essential services.

SPECIAL GRADES OF GR-S AND GR-S-BLACK MADE AVAILABLE

A number of special grades of GR-S, produced in certain government-owned copolymer plants operated for the account of the Rubber Reserve Company, have become available for limited distribution to manufacturing companies. Each of these special grades has been assigned a special GR-S designation (listed in Rubber Reserve Circular No. 37), as follows:

GR-S-AC—This grade has a Mooney viscosity between 45 and 55 but is slower curing than Standard GR-S. It is manufactured by alum coagulation of GR-S Latex Type 1 instead of by salt acid coagulation as is Standard GR-S.

GR-S-10—This grade has a Mooney viscosity between 55 and 65, is slower curing than Standard GR-S, and contains a rosin acid derivative in place of fatty acid.

GR-S-12AC—This grade has a Mooney viscosity between 65 and 75 and is manufactured by alum coagulation of the GR-S latex.

GR-S-20AC—This grade has a Mooney viscosity between 39 and 45 and is manufactured by alum coagulation of the GR-S latex.

GR-S-38—This grade is similar to Standard GR-S except that it is manufactured by a continuous process instead of by batch process.

GR-S-50—This grade is the same as Standard GR-S in which "Stalite" is the stabilizer, and was formerly designated GR-S-ST.

GR-S-85—This grade has a Mooney viscosity between 90 and 110 and has a considerably higher modulus and lower elongation than Standard GR-S.

GR-S-Black 1—This grade is a mixture of 100 parts Standard GR-S with 50 parts of an easy processing channel black.

GR-S-Black 1AC—This grade is a mixture of 100 parts GR-S-AC with 50 parts of an easy processing channel black and is slower curing than GR-S-Black 1.

According to Rubber Reserve, all of the special GR-S grades listed are available at the regular price of 18½c per pound, plus the uniform freight charge, and the two grades of GR-S-Black at 14¾c per pound, plus the uniform freight charge. It has also been announced that Rubber Reserve will sell GR-S-Black plant clean-up material, quantities of which are beginning to accumulate, at a price of 13.28c per pound, which represents a 10% reduction in the established price of 14.75c per pound for Standard GR-S-Black 1.

Sale of GR-A Rubber

Requests for permission to purchase GR-A, the special purpose butadiene-acrylonitrile copolymer generally known as Buna N, should be addressed to the Sales Division, Rubber Reserve Co., 811 Vermont Ave., N.W., Washington, D. C., instead of to the WPB Rubber Bureau, as heretofore. Requests for permission to purchase this material can be prepared in the same manner as requests for GR-S, GR-M, etc. This ruling is covered by Rubber Reserve Circular No. 35.

The circular also pointed out that in accordance with Rubber Order R-1 as Amended, no person shall use GR-A except for the products and purposes specified in Appendix 1 of that order. Experimentation with GR-A, however, need not be confined to permitted uses and as much as 200 pounds per month may be consumed for such purposes.

Completes 1943 Renegotiation

F. B. Davis, Jr., chairman of the board of the U. S. Rubber Co., has reported to stockholders that final settlement with the government covering renegotiation of war contracts for the year of 1943 has been determined and, after application of Federal income taxes, such settlement amounts to $646,809. The income statement, as presented in the annual report for 1943, included a net provision for renegotiation, after taxes of $1,924,700, which was more than sufficient for the purpose. The excess provision of $1,277,891 is being returned to earnings of the company.

Goodrich has announced the establishment of a new products department in its aeronautical division for the purpose of "developing new products of rubber, synthetic rubber and plastics for aviation use." The company is said to currently manufacture more than 80 rubber products for aircraft application.

Changes at Fisk Tire

In a move aimed at widening the scope of the sales organization of the Fisk Tire Division of the U. S. Rubber Co., the following changes have been announced by company officials: H. E. Malcomb has been made merchandise manager of tires; A. N. Guy, manager of business development; A. G. Richtmyer, manager of distribution planning; C. N. Suffill, manager of sales promotion and publicity; H. C. Cookson, sales operation manager; and A. M. Watt, manager of the passenger car tire department.

The impact of synthetic rubber on the economic life of the United States is discussed by P. W. Litchfield, chairman of the board of the Goodyear Tire & Rubber Co., Akron, in a pamphlet recently issued by the company. The pamphlet is one of a series of "Notes on America's Rubber Industry" distributed by Goodyear.

Shifts Sales Personnel

A. Schrader's Son, Division of Scovill Manufacturing Co., Inc., Brooklyn, N. Y., has announced several changes in its sales organization including the following: A. R. Baldwin, former district representative in Los Angeles, is now assistant manager of accessories sales at the Brooklyn headquarters; C. M. Huffman, who formerly covered the Rocky Mountain states, with headquarters in Denver, has been transferred to Los Angeles; Chaplain E. Lawton has been appointed district representative in the territory formerly covered by Mr. Huffman; E. H. McClure, previously the district representative covering the Chicago area, will now devote his entire time to the agricultural market; and J. H. Carruthers replaces Mr. McClure in the Chicago area.

February Tire Quotas

The passenger car tire quota for February, announced by OPA on January 30, was the lowest since October, 1944. It provides for only 1,600,000 units, including motorcycle tires, and compares with 1,800,000 allowed for the previous month. Truck and bus and tractor-implement tire quotas were generally unchanged from January, being as follows: 216,000 for truck and bus tire sizes 7.50 and smaller; 110,200 for truck and bus sizes 8.25 and larger; 50,000 for tractor-implement sizes 7.50 and smaller; 21,000 for tractor-implement sizes larger than 7.50. The only change made was in the latter category, which represents an increase from the 20,000 units provided in January.

Old Certificates Invalidated

All tire ration certificates dated March 31, 1944, and earlier were invalidated on December 27 with the issuance of Amendment No. 92 to Ration Order 1A (Tires, Tubes, Recapping and Camelback). In issuing the amendment OPA pointed out that very few of these old certificates are still unused in the hands of consumers and the action is not expected to affect very many vehicle operators. The amendment also revokes the requirement that an applicant for tires for a commercial motor vehicle present the Certificate of War Necessity he is required to hold for the vehicle at the time he applies for tires.

The Bureau of Aeronautics, Navy Department, has specified the use of Kellogg Koiled Kords, product of the Kellogg Switchboard & Supply Co., Chicago, in navy plane cockpits.

The opening of a completely staffed and equipped district office in Charlotte, N. C., for its mechanical goods division has been announced by Goodyear as a result of its vastly increased industrial activity in North and South Carolina and in Virginia.

DAVIS URGES RETENTION OF SYNTHETIC RUBBER PLANTS

The retention of synthetic rubber plant facilities in the United States not only to meet the supply deficit foreseen for the first few postwar years but as insurance against another possible severance of rubber supply lines was urged by F. B. Davis, Jr., chairman of the board of the U. S. Rubber Co., in an address delivered before the Economic Club in Detroit on January 29.

In his talk, Mr. Davis estimated that it would take five years to restore natural rubber plantations to full capacity production once the rubber areas in the Far East are liberated, and that such production might reach 600,000 tons in the first year after liberation, against a potential world demand of 1,500,000 tons annually.

Discussing the future of synthetic rubber, the U. S. Rubber executive stated that the plants should be retained on a firmer footing than "standby" operations, since "the American public is intelligent enough to know that this cannot be accomplished merely by having standby plants which do not operate. Such plants have a way of being neglected and forgotten and finally disposed of. The average voter is going to demand the continued operation of at least a portion of the synthetic rubber plants."

"It seems reasonable to assume that portion will amount to at least 200,000 tons of GR-S. We do not see how this quantity can amount to more than 600,000 tons, for it is estimated that only 600,000 of the 1,000,000 tons GR-S producing capacity in the United States and Canada can be produced at low cost. If these figures are right, then the future world demand for synthetic rubber of all types will be between 300,000 and 700,000 tons. And the demand for natural rubber will be between 800,000 and 1,200,000 tons."

Mr. Davis added that he hoped "each type of rubber will be allowed to seek its own price level in a free, unmanipulated market." Earlier he told how natural rubber prices had jumped around from $3 to 3c a pound and called the fluctuations "the most serious financial problem of the industry."

Farrel Seeks Atwood Co.

According to an announcement made on February 8, the Farrel-Birmingham Co., Ansonia, Conn., has offered to buy the Atwood Machine Co., Stonington, Conn., manufacturers of textile machinery. The offer will be considered by Atwood stockholders on February 15 and if accepted Farrel will take over on April 1 with the present personnel and management retained. Franklin R. Hoadley, president of the Atwood Co., and former president of the Farrel-Birmingham Co., returns to the latter company in his former position shortly, succeeding John W. Haddock who recently resigned.

Coming Events

Mar 9. Philadelphia Rubber Group (First Meeting), Benjamin Franklin Hotel, Philadelphia, Penna.

Mar. 9. Montreal Rubber & Plastics Group, Ritz-Carlton Hotel, Montreal, Canada.

Mar. 23. Chicago Rubber Group, Morrison Hotel, Chicago, Ill.

Apr. 13. New York Rubber Group, Building Trades Club, New York, N. Y.

May 18. Chicago Rubber Group, Morrison Hotel, Chicago, Ill.

June 18-22. A.S.T.M. Annual Meeting, Hotel Statler, Buffalo, N. Y.

Sept. 10-14. American Chemical Society, Annual Meeting, Chicago, Ill.

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R.M.A. Establishes Library

In order to assist writers, students and other individuals looking for information about rubber and the rubber manufacturing industry, the Rubber Manufacturers Association, Inc., has established an Information Library at its offices at 444 Madison Ave., New York City. The library will include all available non-technical books on the subject of rubber, trade publications, catalogs and booklets, newspaper clippings, etc. Miss Dorothy L. Parker, formerly with the Newark Public Library, has been named as Librarian. At the same time, the R.M.A. announced the addition of Miss Helen C. Richwine, associated with the Office of the Rubber Director at Washington for the past two years, to its staff. She will act as an assistant to Ross Ormsby, secretary of the Rubber Manufacturing Committee.

Rexon Vibration Mount

Rexon, described as a radically new type of vibration mount, characterized by extreme simplicity in design and application, and by virtual indestructibility in use, has been introduced by the Hamilton Kent Manufacturing Co., Kent, Ohio. The new mount utilizes the vibration dampening properties of rubber in shear, but with no possibility of overloading the shear elements. This property is said to stem from the use of a special "X" type design of the rubber element which acts in shear at the points of the "X" under normal loading, but in compression when the load exceeds the rated capacity of the mount. According to the company, Rexon mounts cannot be damaged by temporary or permanent overload. No rubber-to-metal bonds, either mechanical or chemical, are used.

SYNTHETIC RUBBER BOOM IS PREDICTED BY BLAKE

A synthetic rubber boom in the postwar period was predicted by Dr. John T. Blake, director of research of the Simplex Wire & Cable Corp., Cambridge, Mass., in a survey of "Past, Present and Future of Synthetic Rubber," recently presented to the Northeastern Section of the American Chemical Society. Boom conditions will continue for a fairly long period, according to Dr. Blake, regardless of political considerations because of the built-up deficit of rubber goods.

"It is doubtful that the plantations are coming back very quickly," said Dr. Blake, "and even if they could they will not be able to supply our needs for several years. I do not believe that natural rubber will be a free commodity for four or five years, even though our supplies increase appreciably. This supply will be under allocation by Washington to be used where it is definitely superior to synthetic rubber.

"The industry has four or five years in which to make good. By this I mean the production of a material which will serve as a general purpose synthetic. There will always be a demand for the specialty rubbers that are definitely superior to natural rubber. In effect, the synthetic rubber industry is only two years old, and when we see the amazing technical improvements that have occurred in this period of time I have hopes that in the four or five years allotted to it without competition all this may be accomplished.

"The products that will be made from synthetic rubber several years from now will be far better in quality as a result of the advances in these various directions. Whether those products will be better than can be made from natural rubber remains to be seen, but I am sure they will be but little inferior and there is a good chance that they may be superior."

Dibasic Acid for Resins

The development of a new dibasic acid, of special interest to chemists working with alkyd and other resins and drying oils, has been announced by the Heyden Chemical Corp., New York City. Known as M.D.A., the new product is a technical grade of methylene disalicyclic acid, and consists of a mixture of isomers, principally the para-para. An interesting and significant chemical property of the new acid is the combination of the reactive carboxylic acid groups with the phenolic groups in the same molecule. By this combination it would be expected that the versatility of the alkyd type resins would be combined with the chemical resistance of the phenolic types, and such an expectation is said to have been borne out in experiments at the Heyden laboratories.

USE OF RUBBER IN RAILROADS OUTLINED AT A.S.M.E. MEETING

Generous use of rubber insulation achieves two objectives in improvement of railroad pasenger car trucks by reducing noise level and eliminating friction surfaces to increase life of truck parts, according to an address made by K. F. Nystrom, mechanical assistant to the chief operating officer of the Chicago, Milwaukee, St. Paul & Pacific Railroad, before the recent annual meeting of the American Society of Mechanical Engineers, held in New York City.

Two other objectives, reduced weight and improved riding qualities, also have been approached by use of high tensile steel and aluminum and by changes in spring design, the speaker said. He held that in tests on the Milwaukee Road no difference in riding quality could be observed between a four-wheel truck and a six-wheel truck.

Concerning the use of rubber in passenger car truck construction, Mr. Nystrom said: "We have aimed to reduce the noise level inside the car, and anyone who has tried to discover the source of noise will appreciate that this is a difficult problem. Assuming that most of the noise originates from the truck, we have probably taken some unusual precautions, and in so doing have obtained unusual and unexpected results." Among such precautions, he said, was use of rubber cushions of three-eighths to one inch thickness at vital parts in the passenger trucks.

"By freely employing rubber insulation between truck parts," he continued, "metallic contact creating noise has been reduced. Continuing our search, we discovered that although we had, to the best of our ability, insulated the truck from the car body, there is a fertile field for study of sources and transmission of airborne noises to the inside of the car through tubular vertical end door posts in the frame of the body and the vestibule itself.

"Friction creates wear and consumes power, and both add to the expense of maintaining passenger car trucks; its elimination means increased life and less adjustment of parts. By introducing rubber between the truck and body center plate, as previously mentioned, all wear on those members was eliminated, and we know that the life of the rubber is more than six years, having had some in service for that length of time. We have, by means of rubber mounted guide members, eliminated the wear in bolsters, boxes and pedestals which previously existed."

Ideal Latex Corp. Moves

The Ideal Latex Corporation, which was located at 445 Greenwich Street in New York City, has moved its factory to 741 Main St., Stamford, Conn. C. L. Beal is vice-president of the company.

New Wader Type Boot

A knee-length boot, designed for wet-cold climates, has been developed by the Quartermaster Corps to take the place of the standard overshoe under some conditions in combat areas. The rubber shell, or foot, is made over the regular overshoe last, but the leg, which extends well over the knee, is made of lightweight, olive drab, rubber-coated fabric, and is fastened above the knee with an adjustable buckle, and snap fasteners below the knee. This arrangement provides greater protection and comfort to the wearer. The foot of the boot is equipped with four pairs of eyelets and leather laces to insure a better fit to the foot. In spite of its greater length, the boot is lighter than the calf length overshoe. It may be packed in a smaller space, as the fabric leg portion is flexible enough to permit its being conveniently wrapped The boot is designed for wet-cold conditions and affords greater protection than the overshoe in driving rains, or deep mud. Fifty thousand pairs of the boots are now being procured.

Tompkins Named as Consultant

L. D. Tompkins, formerly a Deputy Rubber Director and a former vice-president of the U. S. Rubber Co., who recently returned to Washington as a special assistant to James F. Byrnes, head of the Office of War Mobilization and Reconversion, will also serve as a consultant to J. A. Krug, WPB chairman, and to James F. Clark, director of the WPB Rubber Bureau, according to an announcement made last month. Mr. Tompkins' principal job is coordination of the efforts of the several agencies responsible for the rubber production program.

Flintkote Buys Whippany Plant

The rubber manufacturing plant at Whippany, N. J., formerly operated by the Manhattan Rubber Manufacturing Division of Raybestos-Manhattan, Inc., has been acquired by the Flintkote Co. The purchase was part of an expansion program recently launched by Flintkote.

U. S. RUBBER ADDS NEW CEMENT BUILDING TO ITS INDIANAPOLIS PLANT

As part of its $25,000,000 program to increase production at its five major tire and tube plants, the U. S. Rubber Co. has added a new building to its Indianapolis, Ind., plant for producing rubber cement needed in making synthetic tires and tubes. The new building, the interior of which is illustrated above, is said to be the last word in safety and a model of engineering design. Hazards created by inflammable solvents and the potential danger of explosion from accumulated solvent vapors coming in contact with electrical sparks are eliminated. All electric fixtures and installations such as lights and motors are grounded and sealed against the possibility of electric spark. As a further precaution, a special spark-proof telephone has been installed. Accumulated solvent vapors are carried off by a series of blowers and a ventilating system provides a complete change of air throughout the building every two minutes. The air supplied to the building from the ventilating units is kept at high humidity to prevent discharge of static electricity. To offset the damaging effects of a possible explosion, carefully designed panels are set in the walls. These are top-hinged and will provide relief when a small amount of pressure is applied. The Indianapolis plant, according to U. S. Rubber, is the largest producer of inner tubes and bicycle tires in the world.

MONTREAL RUBBER GROUP HEARS TALK ON POLYMERS

A discussion of "Tailor-Made Polymers," by Dr. J. G. Mark, of the Dewey & Almy Chemical Co., Cambridge, Mass., featured the meeting of the Rubber & Plastics Division, Montreal Section, Society of Chemical Industry, held on January 12 at the Ritz-Carlton Hotel in Montreal. Unfortunately, very bad weather conditions resulted in a poor turnout at the meeting.

In his talk, Dr. Mark first discussed the three stages of development of a desired finished product, and then went on to show how these stages had occurred in the development of rubber polymers. He described these stages as the utilization of the natural product, a modification of that product to fit desired requirements more closely, and finally the development of synthetic products for specific purposes.

Dr. Mark also traced the history of the development of rubber polymers and showed how these polymers are currently being adjusted for specific applications. At the conclusion of his talk, he showed a film illustrating many of the applications of Dewey & Almy products and their facilities for research and development.

The group was also scheduled to hold a meeting on February 9th, at which William Woodcock, of the Carbide & Carbon Chemical Corp., New York City, was to speak on "Plasticizers." A report of this meeting will appear in our next issue. A meeting is also scheduled for March 9, at which E. H. Krismann, assistant sales manager of the DuPont Rubber Chemicals Division, Wilmington, Delaware, will be the principal speaker.

Chicago Group Cancels Meeting

On the advice of the War Committee on Conventions, the Chicago Rubber Group cancelled the meeting it was scheduled to hold on February 2. The meeting was to have featured a Symposium on Reclaimed Synthetic Rubber, and three papers covering various aspects of that subject were scheduled. The Executive Committee of the group is working on a plan for the meetings which are scheduled to be held on March 23 and May 18 whereby, if only local gatherings are permitted, a digest of the meetings will be supplied to all out-of-town members. It is not certain at this writing whether the Symposium on Reclaimed Synthetic Rubber will be held at one of the later meetings or be indefinitely postponed.

After three years, a package of Pliofilm-wrapped raisins was opened in the office of the California Foods Research Institute and the raisins were found to be in perfect condition for eating, according to a Goodyear report. The raisins were said to have held their moisture throughout the period.

Appointed to Akron Staff

Ralph B. Appleby

Ralph B. Appleby, connected with the Cleveland office of the Electrochemicals Department of E. I. du Pont de Nemours & Co., Inc., for the past eight years, who was transferred to the company's Rubber Chemicals Division at the beginning of the current year, has been appointed to the Akron staff of that division. He will assist H. A. Hoffman, manager of the Akron branch, in technical sales activities in the Ohio territory. Prior to joining DuPont, Mr. Appleby was successively connected with Goodrich, American Cyanamid and Thermatomic Carbon. He lives at 615 Moreley Avenue, Akron, and will operate from there until remodelling and installation work are completed on the new DuPont office and service laboratory in Akron.

New York Meets April 13

At a meeting of the Executive Committee of the New York Rubber Group, held in New York City on January 31, the next meeting of the group was definitely set for Friday, April 13, at the Building Trades Club in New York. A motion was made and passed that a Program Committee be appointed annually and the following were named to the committee for the current year: George J. Wyrough (Whitehead Bros.), vice-chairman of the group, as chairman; W. B. Dunlap (Lee Rubber), A. P. Stubbs (Manhattan Rubber), Pete Murawski (Du Pont), and H. L. Fisher (U. S. Industrial Chemicals).

Mansfield Tire & Rubber Co., Mansfield, Ohio, was recently found in violation of the wartime wage regulations and was fined a total of $15,000. The company plan of raising wages of new employees 10 cents an hour after their first day of work was the major violation.

AUTOMOBILE GROUP REPORTS ON SYNTHETIC TIRE LIFE

On the basis of a 25,000-mile road test, the American Automobile Association recently reported that the new synthetic rubber tires for passenger cars are good for 37,500 miles, plus an additional 22,500 miles after recapping, provided they are not driven more than 35 m.p.h. and are kept properly inflated.

Tires (all 6.50 x 16) made by six different manufacturers, purchased at random from retail dealers, were used. "Estimated total mileage before exposing fabric," based on measured wear, was placed at 27,800 miles for the tire that was worn down the most, and 44,900 miles for the tire showing the least wear.

Two other tires of prewar manufacture retreaded with Grade C camelback indicated total mileage of 28,500 and 32,400, respectively, from which the A.A.A. concluded that recaps on synthetic tires should add at least 22,500 miles to life of the original tire.

Synthetic rubber tubes also came through with credit. Of five different makes tested, only two failed, after 17,749 miles and 24,305 miles, respectively.

Form Philadelphia Rubber Group

The Philadelphia Rubber Group, latest of the local rubber groups, was tentatively organized by representatives of some twenty companies meeting in Philadelphia on January 10. Temporary officers named include: *Chairman,* R. S. Hanslick (Quaker Rubber); *Vice-Chairman,* W. B. Munroe (Linear Packing); *Treasurer,* L. H. Youse (Gilmer); *Secretary,* J. A. Popp, Jr. (Shell Oil). The first dinner meeting of the new group will be held on Friday evening, March 9, at the Benjamin Franklin Hotel, Philadelphia. The principal speaker will be Dr. A. A. Somerville, of the R. T. Vanderbilt Co., whose subject will be "Getting Technical Work Done." Further details concerning the group and the initial meeting can be secured by writing to J. A. Popp, Jr., Room 1534, 12 South 12th St., Philadelphia 7, Penna.

Ontario Group Sees Films

The presentation of four sound motion pictures on rubber subjects featured the meeting of the Ontario Rubber Section of the Chemical Institute of Canada, held on January 23, at the University of Toronto in Toronto, Ontario, Canada. Approximately 80 members and guests attended the meeting, with some fifty present at dinner. Two of the films—Battle of Britain and Highballing to Victory—were shown through the cooperation of the U. S. War Department, and two—Freedom Rides on Rubber and All Out for Victory—through that of the Firestone Tire & Rubber Co.

COTTON TIRE CORD POSITION OUTLINED BY BIBB OFFICIAL

Cotton tire cord is being made today which is better than rayon tire cord, according to M. W. Rozar, director of research and development of the Bibb Manufacturing Co., in an article which appeared in the January 29, 1945, issue of the New York *Journal of Commerce.*

The majority of people believe that rayon is a better material for tire cord because they have been led to believe that such is the case by public pronouncement of government officials and others, Mr. Rozar wrote, and the fallacy occurs by reason of the fact that whereas the term "rayon tire cord" refers to a quality and construction highly standardized, the term "cotton tire cord" is a collective expression and includes cords made of an infinite variety of qualities of cotton, constructions of yarn, plies in forming and cabling, twists, and processes.

Admitting that there is no contention that rayon is not superior to some cotton tire cords, Mr. Rozar stated that tests on tires of rayon against many of these cords have misled many otherwise well-meaning people. He stressed the fact, however, that tests conducted with the best cotton cord, properly processed by methods developed through modern research, show that such cotton cords do produce tires of greater durability, lower heat generation in synthetic as well as natural rubber tires, and especially greater freedom from the distorting growth which still is the bane of the engineers who are working on the problem of adapting rayon to use in cords in tires.

One important factor in this question is generally overlooked, according to the Bibb official. It is the common assumption that today the life of the tire is wholly dependent upon the relative durabality of the cord, whereas actually the cord, whether rayon or cotton, is today definitely the best element in the tire, whether made of natural or synthetic rubber. When the engineer can produce rubber compounds capable of withstanding abrasion and flexing and the tendency for the components to separate for a period equal to the capabilities of the cord, we are likely to see many tires that come very close to serving for the life of the vehicle in the hands of the original owner.

Proof of this statement is the existence of the thriving recapping industry. This is not to say that the quality of the cord has no bearing on the life of the tire, but it is a fair analogy to say that the durability of the cord extends the life of the tire in much the same manner that a strong constitution will maintain the life of a person afflicted with a wasting disease for a longer period of time than would be the case with a person with a weaker constitution.

The tire market is wholly Government controlled today. There is little the cord producer can do to affect the nature of tire cord demand. Most of the producers of cotton tire cord also produce rayon cord, and all of the tire cord producers, together with the rest of the population of the United States, are agreed that our first and only important problem is to win this war. The way to win it is to cooperate with those who have been intrusted with its direction.

Progress is being made in the development of service both in cotton and rayon tire cords. When time and events once again open the markets to free competition, cotton, because of its physical structure better suited to resist the strains and flexings in service in tire cords, will demonstrate that it is the better material when properly processed. The question as to whether it can continue to enjoy the tire cord market may be settled by those who have acquired the power artificially to fix the price.

C. P. HALL CO. BUILDING NEW PLANT IN CHICAGO'S CLEARING DISTRICT

Included among C. P. Hall Co. officials who made the first official inspection tour of the new Chicago facilities were, left to right, Sam A. Davis, J. A. Baty, C. P. Hall, and C. R. Hall.

The first ground-breaking ceremony of 1945 in the Chicago area involved the C. P. Hall Company of Illinois, chemical manufacturers, for whom construction began last month on a new plant in the Clearing Industrial District, a manufacturing suburb adjoining Chicago's southwest edge, and containing approximately 125 industries.

Now heavily engaged in the manufacture of chemicals for the rubber industry, the new facilities provide the C. P. Hall Company with additional processing capacity, greatly increased distribution facilities (the plant will have its own private switch tracks, served by the immediately adjoining Belt Railway of Chicago), and generally increase the firm's scope as manufacturers of their own materials, as manufacturers' representatives, and as jobbers. The site selected for the new facility contains 53,000 square feet of land, and the local address is 5145 West Sixty-seventh Street, Chicago.

In making the new building announcement, Sam A. Davis, vice-president and general manager of C. P. Hall Company of Illinois, said that the move was undertaken to help increase the war output of Hall's complete line of compounding materials, besides further improving the company's midwest coverage and speed of distribution. An allied personnel move also announced was the appointment of J. T. Adair as southern representative of the Chicago plant, with headquarters in Atlanta.

Headquarters operation of the C. P. Hall Company is at Akron, Ohio, from which point the company serves the eastern field, with warehouses in both New York and Boston. C. P. Hall is president of the company. Other officers are A. E. Warner, vice-president, and L. G. Hummel, secretary and treasurer. Beside the Illinois company, the corporation also operates the C. P. Hall Company of California, of which R. D. Abbott is vice-president and general manager.

Buy High Frequency Patents

Announcement was made in Akron on January 24 that basic patents covering the electronic vulcanization of rubber and other materials have been purchased by the B. F. Goodrich Co. and the Firestone Tire & Rubber Co. The patents are those originally granted on discoveries made by R. A. Dufour and H. A. Leduc of France and E. E. W. Kassner of Switzerland. It was also stated that the patents would be made available to both the rubber and plastics industries "on a reasonable basis." In connection with the announcement, it was reported that sponge rubber mattresses and pads have been cured by the patented electronic methods, which utilize high frequency heating, in one-eighth the time needed by conventional processes.

Thomas Awarded Gold Medal

The Gold Medal of the American Institute of Chemists, one of the chemical world's highest honors, has been awarded to John W. Thomas, chairman of the board of the Firestone Tire & Rubber Co., Akron. The medal, presented annually for noteworthy and outstanding service to the science of chemistry or the profession of chemist in America, was given to Mr. Thomas in recognition of his leadership in rubber research for four decades and for achievements under his direction in the development and production of synthetic rubber. Formal presentation of the award will be made on May 11 at Columbus, Ohio, during the 23rd annual meeting of the A.I.C. Former recipients of the medal include Willard H. Dow, Andrew W. Mellon, James Bryant Conant, and George Eastman.

Wanted: A Knapsack Sprayer

Included among some 25 inventions wanted by the U. S. Navy is a knapsack sprayer for oil or liquid. The knapsack must be of simple construction, have easily replaceable and reproducible parts, have a minimum number of rubber parts and gaskets, and be light, rugged, durable and leakproof. A nonsparking shoe sole, reasonably durable, which is not injurious to the feet and which will not slip on the oily steel deck of ships rolling as much as 17 degrees, is also desired. Suggestions should be sent to the National Inventors Council, c/o Department of Commerce, Washington, D. C.

Cancel N.A.W.M.D. Convention

In accordance with the request recently made by the Office of War Mobilization to the effect that conventions be cancelled or postponed until such time as transportation and hotel facilities are sufficiently improved, the National Association of Waste Material Dealers, Inc., which maintains headquarters in New York City, has voluntarily cancelled its annual convention which was scheduled to be held in Chicago in March. The Association may hold the convention later in the year if it can do so with the full approval of the War Committee on Conventions.

Organize Research Institute

The Midwest Research Institute has been organized at Kansas City, Mo. The Institute's laboratories are currently being equipped to cover all research activities, including the fields of chemistry, physics, metallurgy, minerology, biology, bacteriology, chemical, civil, electrical and mechanical engineering, and other fields of science and science application. Harold Vagtborg, former director of the Armour Research Foundation, Chicago, is president of the Institute.

CARBON BLACK NOMENCLATURE

Below is published a revised table of Carbon Black Nomenclature listing brand names by suppliers, as well as the original table of symbols agreed upon by a special committee of the Office of the Rubber Director, the functions of which are now vested in the WPB Rubber Bureau. The list, last published in the September, 1943, isue of RUBBER AGE, has been revised and brought up-to-date and includes brand names under the Conductive Channel (CC) classification for the first time. The inclusion of a brand name under any classification is the evaluation by the supplier of the type of black covered by that brand name. Only brand names used in the domestic market are included.

Name	*Symbol*
Hard Processing Channel	HPC
Medium Processing Channel	MPC
Easy Processing Channel	EPC
Conductive Channel	CC
Conductive Furnace	CF
Fine Furnace	FF
High Modulus Furnace	HMF
Semi-Reinforcing Furnace	SRF
Fine Thermal	FT
Medium Thermal	MT

BRAND NAMES BY SUPPLIERS

Symbol	*Brand Names*	*Suppliers*
HPC	Atlantic No. 98	Johnson
	Continental F	Witco Chemical
	Huber HX	Huber
	Kosmobile S	United Carbon
	Micronex Mark II	Binney & Smith
	Spheron No. 4	Cabot
	Supreme SH	Imperial Oil & Gas
	Witco No. 6	Witco Chemical
MPC	Atlantic No. 109	Johnson
	Continental A	Witco Chemical
	Hi-Tear Micronex	Binney & Smith
	Huber TX	Huber
	Kosmobile	United Carbon
	Kosmobile 66	United Carbon
	Spheron No. 6	Cabot
	Standard Micronex	Binney & Smith
	Supreme MM	Imperial Oil & Gas
	Witco No. 1	Witco Chemical
EPC	Atlantic No. E-42	Johnson
	Continental AA	Witco Chemical
	Kosmobile 77	United Carbon
	Micronex W-6	Binney & Smith
	Spheron No. 9	Cabot
	Supreme VF	Imperial Oil & Gas
	Witco No. 12	Witco Chemical
	Wyex	Huber
CC	Continental R-20	Witco Chemical
	Continental R-40	Witco Chemical
	Huber CX	Huber
	Huber 35-C	Huber
	Spheron I	Cabot
	Spheron C	Cabot
	Spheron N	Cabot
	Voltex	United Carbon
	Witco 240	Witco Chemical
	Witco 270	Witco Chemical
CF	FB 200	Huber
	Gastex No. 364	General Atlas Carbon
	Kosmos 97	United Carbon
	Statex A	Binney & Smith
FF	Statex B	Binney & Smith
HMF	Continex HMF	Witco Chemical
	Kosmos 40	United Carbon
	Modulex	Huber
	Philblack A	Phillips Petroleum
	Statex 93	Binney & Smith
	Sterling L	Cabot
	(*)	General Atlas Carbon
SRF	Continex SRF	Witco Chemical
	Furnex	Binney & Smith
	Gastex	General Atlas Carbon
	Kosmos 20	United Carbon
	Sterling S	Cabot
FT	P-33	Vanderbilt
MT	Shell Carbon	Shell Oil
	Thermax	Vanderbilt
	Velvetex	Binney & Smith

* To be announced later.

Gilliland Wins Baekeland Award

Dr. Edwin R. Gilliland, former assistant rubber director and now on duty with the Office of Scientific Research and Development in Washington, has won the first Leo H. Baekeland Award of the North Jersey Section of the American Chemical Society. The award, consisting of $1,000 and a gold medal, is made biennially to an American chemist under the age of 40 in recognition of accomplishments in pure or industrial chemistry. Dr. Gilliland is 36 years old and is a Professor of Chemical Engineering at the Massachusetts Institute of Technology. He received the award for his achievements in heat transmission, diffusion, distillation, and high pressure synthetic chemistry. The award will be presented at a meeting of the North Jersey Section in Newark on May 14.

Fire Destroys Fremont Plant

Fire of undetermined origin completely destroyed the plant of the Fremont Rubber Co. at Fremont, Ohio, on January 12. Two carloads of compounded rubber and some 500,000 pounds of raw materials were also destroyed, the entire loss being estimated at approximately $500,000. The plant, of which R. P. Johnson was general manager, was engaged in compounding rubber for Firestone. According to Mr. Johnson, the plant will be rebuilt in the near future if priorities for material and machinery can be secured.

Marmix—Latex Reinforcer

The development of "Marmix," a water dispersion of an organic resin, which finds special application with GR-S latex, wherever high tensiles and abrasion and tear resistance are required, has been announced by the Marbon Corporation, Gary, Indiana. Use of 10 to 30% of the new reinforcing agent with GR-S latex is reported to result in tensiles as high as 2,800 to 3,000 pounds in so-termed pure gum compounds.

KOPPERS CO. ISSUES REPORT ON ITS KOBUTA OPERATIONS

More than 153,000 tons of butadiene were produced through the catalytic conversion of ethyl (grain) alcohol at Kobuta from July, 1943, when first production began, up to December 31, 1944, according to a report issued by Dan M. Rugg, vice-president of the Butadiene Division of the Koppers Co., Inc., which operates the plant for the Rubber Reserve Co.

Kobuta, which covers 200 acres, is one of three plants making butadiene from alcohol in the government program. It is located in the Beaver Valley, some 25 miles from Pittsburgh. Four butadiene units, each with a rated annual capacity of 200,000 tons, are in operation. Because of higher requirements for synthetic rubber and the diversion of butylenes to aviation gasoline, the units are operating at slightly better than 160% of rated capacity.

In addition to the butadiene units, a styrene production plant also is operated at Kobuta. With an annual rated capacity of 37,500 tons, it has been in operation since late in August, 1943, and between then and December 31, last, produced more than 38,000 tons of styrene, Mr. Rugg stated. At its rated capacity Kobuta produces about one-seventh of the entire nation's supply of butadiene and styrene.

From January to August, 1944, butadiene was being produced at Kobuta at approximately 175% of the rated capacity. In the latter month, however, the production of synthetic rubber caught up with the ability of the various rubber companies to handle it. This resulted in the gradual curtailment, by the government, of the rate of production until, in December, 1944, Kobuta was producing butadiene at approximately 110% of its rated capacity.

With the improvement in the manpower situation in the tire plants at the beginning of this year, requirements of butadiene and styrene were stepped up sharply and, more recently, diversion of some of the feed stock from petroleum butadiene plants in the South, put the production schedule back to the maximum obtainable.

Three Shifts Employed

Production is being maintained around the clock at Kobuta, some 1,150 employees being engaged in working three shifts. Approximately 35% of the plant's employees are women, who have been trained for such jobs as chemical operators and operators' helpers and stillmen, and stillmen's helpers, whose duties are to regulate the flow, and control the temperatures and pressures of the stills. Yet another group of women work in the analytical laboratories running routine tests.

In the production at Kobuta during the past eighteen months, Mr. Rugg said, approximately 150,000,000 gallons of 190 proof, grain alcohol have been used. This alcohol is shipped to Kobuta in barges and tank cars. At peak production the rate of alcohol consumption is nearly 40 tank cars a day. The butadiene and styrene produced is shipped to Akron, Ohio, and to Naugautuck, Conn., as well as to other Government plants.

In addition to butadiene and styrene, a number of other chemicals are produced at Kobuta from the by-product oils and gases of butadiene manufacture. Ether, recovered from the by-product oils, is being used to replace ethyl alcohol in the production of styrene. A plant now under construction will recover ethylene gas. This also will be used in producing styrene and will replace more alcohol. This plant is expected to be placed in operation in April of this year.

Plant is Self-Sufficient

"With the ethylene gas to be recovered by this plant, and with the ether being recovered from the by-product oils, being substituted for ethyl alcohol, Kobuta will be self-sufficient insofar as the alcohol requirements for styrene are concerned," Mr. Rugg said, adding, "and it is estimated, nearly 10,000,000 gallons of alcohol will be saved."

Toluene, to the amount of some 50,000 to 60,000 gallons a month, is being currently recovered from the production of styrene at Kobuta. This goes into the nation's TNT and aviation gasoline. There also has been a recovery of secondary butyl-benzene, which has gone to various oil companies for blending in aviation gasoline. Also recovered have been large quantities of polyethylbenzene. This has been supplied those companies using the alkylation process as feed stock for production of ethylbenzene.

Other chemicals, such as butanol, and other gases are being experimentally produced at Kobuta, Mr. Rugg said. For some of these the uses and markets are known. Others are entirely new chemicals, the end uses of which have yet to be determined. Research is being conducted at Kobuta, Mellon Institute and elsewhere, to determine to what use these new chemicals may be put.

Some quantities of dicyclopentadiene and xylene, the latter used as a solvent, also are being produced at Kobuta during the manufacture of butadiene and styrene. These have been supplied to various chemical companies.

The residual by-product oils and gases, after recovery of the chemicals named above, are being used as fuel in the process furnaces at Kobuta, Mr. Rugg said. He added that, as research disclosed commercial possibilities for those chemicals so far recovered, or resulted in the discovery of other chemicals, together with uses and markets for the same, still further use would be made of these by-product oils and gases, before final disposition, presumably as fuel.

ASME Rubber Group Chairman

Ellwood F. Riesing

Ellwood F. Riesing, chief automotive engineer of the Firestone Tire & Rubber Co., with headquarters at Detroit, Mich., was recently elected chairman of the Rubber & Plastics Division of the American Society of Mechanical Engineers, as reported in a previous issue. Mr. Riesing is a graduate of the Engineering School of Wisconsin University and spent two years in engineering work in Europe and a year in Russia before becoming active in automotive design and engineering work for Firestone. His activities of late have naturally centered on developing and designing mechanical rubber goods for all types of war vehicles and aircraft, particularly bullet sealing gasoline tanks. He is an active member of the Society of Automotive Engineers and for the past four years has been a member of the executive committee of the Detroit Rubber & Plastics Group, Inc.

Jenkins Brothers Exonerated

The government case against Jenkins Brothers, Bridgeport, Conn., and two officers of that company, originally charged with using rubber in valve products in excess of quotas established by the War Production Board, was nolled in Federal Court at Hartford, Conn., on February 6. It was stated that additional information had come to the attention of the Federal district attorney handling the case proving that there had been no criminal intent either on the part of the corporation or by its officers, but merely carelessness and confusion.

Interscience Publishers, Inc., 215 Fourth Ave., New York 3, N. Y., has issued its 1945 catalog of books on mathematics, engineering, geology, physics, medicine, and related subjects. Copies are free on request to the company.

NAMES IN THE NEWS

W. H. BARTLETT, formerly production superintendent of the Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ontario, was recently made assistant works manager of that company. W. MORRISON was appointed superintendent of the company's tire and tube departments.

CLARENCE MOORE, well-known rubber chemist, who has been acting as director of research for the Thermoid Rubber Co., Trenton, N. J., for the past year or so, has left that organization.

W. P. TERHORST, formerly head of the Organic Research Department, General Laboratories, U.S. Rubber Co., Passaic, N. J., has joined the Virginia-Carolina Chemical Corp. as manager of research and development. He maintains headquarters at the company's laboratories in Carteret, N. J.

WALLACE E. CAKE, who was director of the plantation research department of the U.S. Rubber Co. in Sumatra prior to the Japanese invasion, has been interned in a civilian concentration camp on that island, according to word received through Red Cross channels.

L. E. SPENCER, of Hartville, Ohio, has been transferred from the position of deputy director to that of consultant to the WPB Rubber Bureau. W. J. SEARS, of Detroit, Mich., who was formerly assistant director of the Bureau, has been named a deputy director.

BRUCE R. SILVER, manager of technical service of the N. J. Zinc Co., New York City, was recently elected president of the newly-formed Chemical Alumni Club of New York University.

DR. D. GARDNER FOULKE, formerly chief chemist of the Garfield Division of the Houdaille-Hershey Corp., has joined the staff of Foster D. Snell, Inc., Brooklyn, N. Y., as director of the analytical department.

J. PENFIELD SEIBERLING, president of the Seiberling Rubber Co., Akron, has been elected president of the recently-organized Advertising Club of Akron. GALEN C. CARTWRIGHT, sales promotion manager of the Goodyear Tire & Rubber Co., was elected a vice-president.

KENNETH D. JOHNSON, chief of the special heavy-duty tire manpower project team maintained in Akron by the Army Service Force, has been promoted from a lieutenant colonel to a full colonel. COL. JOHNSON'S regular assignment is with the labor branch of the Army Signal Corps in Washington, D. C.

HARVEY S. FIRESTONE, JR., president of the Firestone Tire & Rubber Co., Akron, has been awarded the degree of Commander of the Order of the Star of Africa, the highest citation presented by Liberia.

J. R. HOOVER, of the Chemical Division of the B. F. Goodrich Co., Cleveland, Ohio, was recently elected vice-president of the Plastics Materials Manufacturers' Association.

HUGH ALLEN, veteran rubber industry public relations executive and an international authority on lighter-than-air transportation, has completed 25 years of service with the Goodyear Tire & Rubber Co. He has been presented with a diamond studded service pin.

JOHN BLAKE, who has been acting as subcontracting manager at the Bristol, R. I., plant of the U. S. Rubber Co. for the past few years, has been appointed manager of marine cable sales for the company, with headquarters in New York. MR. BLAKE joined the company in 1911 at the Bristol plant, left in 1915 to become factory superintendent of the Bishop Gutta-Percha Co., and returned to the Bristol plant in 1941.

NICHOLAS J. JAMMAL, superintendent of the rubber molding and injection plastics molding divisions of the Vulcanized Rubber Co. at Morrisville, Penna., for the past several years, has been appointed works manager of that plant.

JOHN D. SIMPSON, secretary-treasurer of the Denman Tire & Rubber Co., Warren, Ohio, has been elected to membership in the Controllers Institute of America.

RUSSELL A. FIRESTONE, assistant treasurer of the Firestone Tire & Rubber Co., Akron, has been elected a vice-president and trustee of the National Victory Garden Institute. He was a vice-president of the organization last year, but this marks his first year as a trustee.

H. R. MACK, associated with U.S. Rubber Co. since 1937, has been appointed manager of truck tire sales on the Pacific Coast, a newly-created position which entails the direction of truck tire distribution in the eleven western states.

RALPH M. JOHNSON, sales manager of the abrasive division of the Norton Co., Worcester, Mass., has been named a vice-president of that company. FRANK W. SMITH, sales manager of the grinding division, and MILTON P. HIGGINS, treasurer, were also named vice-presidents.

LOUIS V. KEELER, general manager of the Avia Co., has been elected vice-president of the Rubber Group of the Commodity Exchange, Inc., New York City. AAGE BENDIXSEN, of Hecht, Levis & Kahn, Inc., and NATHAN W. DIAMOND were elected to serve on the Board of Governors of the Exchange to represent the Rubber Group.

D. E. HENDERSON, technical director of the Associated Rubber Products Co., which maintains headquarters at Irvington, N. J., has been appointed general manager of the company's plant at Quakertown, Penna.

MARVIN ACHTERHOF, chief chemist of the Ohio Rubber Co., Willoughby, Ohio, discussed "Synthetic Rubber" at a meeting of the Painesville (Ohio) Rotary Club on January 30.

KENNETH W. HUFFINE, formerly manager of the Waukegan, Ill., plant of the Johns-Manville Corp., has been named vice-president of the Johns-Manville Products Corp. in charge of a new department created to consolidate engineering activities and to expand plant engineering programs for post-war production.

G. W. GROSS and J. F. DONNELLY, both associated with the Brooklyn, N. Y., plant of A. Schrader's Son for the past few years, have been appointed superintendent and assistant superintendent, respectively, of that plant.

WALTER T. JOHNSON, who has been with the Columbia Chemical Division of the Pittsburgh Plate Glass Co. since 1930, and who has been acting district sales manager of the Chicago area for the past six months, has been appointed district sales manager for that area.

F. B. MENGER, who joined the Armstrong Cork Co., in 1936, as a project engineer, and who has held several important production posts since that time, has been named general production manager for all the production activities of the company. G. B. BLAISDELL has been named production manager of floor and munitions production.

JOHN L. COLLYER, president of the B. F. Goodrich Co., Akron, has been elected a vice-president of the National Association of Manufacturers. He has also been appointed to the Association's executive committee.

CAPT. R. E. ROSEVEARE, former manager of the Manila office of the B. F. Goodrich Co., was among the 509 American, Filipino and British prisoners released from the Jap prison at Cabanatuan on Luzon Island following the daring commando raid recently.

Gibson Island Conferences

The special research conferences on chemistry and allied fields will be continued this year at Gibson Island under the auspices of the American Association for the Advancement of Science. Conferences for the summer of 1945 are scheduled for the weeks of June 11 through August 17 and will cover petroleum chemistry, catalysis, organic high polymers, medicinal chemistry, textiles, food and nutrition, vitamins, cancer, corrosion and instrumentation. The conference on organic high polymers, for which Emil Ott will act as chairman and C. S. Fuller as vice-chairman, will be held the week of June 25, and will feature the following papers: *Silicones,* R. R. McGregor; *General Principles Involved in Polymerization Reactions,* H. Mark; *Mechanism of Emulsion Polymerization,* J. R. Vinograd; *Mass Polymerization,* W. E. Hanford; *Copolymerization,* A. G. Chenicek; *Theory of Reinforcement,* Hugh M. Smallwood; *Effect of Carbon Black in Natural and Synthetic Rubbers,* W. R. Smith. A round table discussion will also be held to touch on various subjects on high polymers which could not be covered in the main program.

Dividend for U. S. Rubber

The board of directors of the U. S. Rubber Co. on February 8 declared a total in dividends of $4.00 a share on the 8% non-cumulative first preferred stock, $2.00 to be paid on March 12 to stockholders of record on February 19 and $2.00 on June 11 to stockholders of record on May 21. These payments will be made from net earnings of the company during 1944. A dividend of 50 cents a share on the common stock, from earned surplus as of December 31, 1944, was also declared.

Tires from France

Procurement of some $1,000,000,000 worth of military supplies to be produced in France during 1945 has been initiated by the U. S. Army Service Forces. Included among articles already contracted for, according to an announcement of February 4, are up to 200,000 heavy-duty tires. Some of these tires, however, will be turned out by factories in Belgium. For purposes of procurement within the United States, certain French programs of non-military purchases are being processed by various U. S. Government agencies concerned. Included in the lists of authorized purchases are 7,000 tons of synthetic rubber and 2,500 tons of carbon black.

Delay Export Control Program

The Rubber Reserve Co. has advised the Rubber Manufacturers Association that the export control arrangement, under which exporters shipping rubber products containing natural or government synthetic rubber would be obliged to pay 17½ cents per pound surcharge on all such shipments other than lend-lease, will be held in abeyance until some time around March 15. The additional delay was granted to provide time "for the satisfactory settlement of certain questions now pending regarding government subsidies." The point was stressed, however, that the arrangement has not been abandoned but merely temporarily postponed.

Offer "Rubber Denuding" Service

A special service for the "denuding" of rubber from metal inserts of all kinds is currently being offered to rubber and other manufacturers by the Metallurgical Service Co., 31 East Georgia St., Indianapolis, Indiana. The process, developed by S. A. Silbermann, chief engineer of the company, makes possible the complete removal of rubber from rubber-to-metal bonded products and permits the re-use of the metal part. In the "denuding" operation, excess rubber is first trimmed off and then the assembly is subjected to a low temperature condition for a certain period until the major portion of the rubber is loosened and removed. The metal part is then cleaned with suitable agents so that the surface is completely free of both rubber and the bonding agent employed. The molded inserts may be of steel, brass, bronze and aluminum. When threaded metal parts are involved, special care is said to be taken to prevent injury to the screw thread. The original physical properties of the metal inserts, including Rockwell hardness, are retained.

New Plant for Goodyear

Permission to construct a $1,500,000 chemical plant at Natrium, West Virginia, for the production of vinyl chloride copolymers has been granted to the Goodyear Tire & Rubber Co., Akron, by the War Production Board. The new plant will have a capacity of 3,000,000 pounds a year and will employ a catalytic process, acetylene and hydrogen chloride being passed over catalysts in large tanks. The plant will also manufacture a considerable number of the other organic compounds which will be used in the copolymerization process.

SEIBERLING RUBBER COMPANY OFFICIALLY OPENS ITS NEW ADMINISTRATIVE OFFICE AND LABORATORY BUILDING IN BARBERTON

The new combination administrative office and laboratory building of the Seiberling Rubber Co. was officially opened in Barberton last month. It is a three-story, reinforced concrete building, representing a cost of approximately $450,000. In addition to administrative and sales offices and a completely equipped laboratory, the building houses a 10-room hospital, equipped for the treatment of ailments and injuries, for x-rays, and for minor operations. Two cafeterias, one for office personnel and the other for factory workers, are located on the basement floor. Construction of the new building permitted the company to add 52,000 square feet of production space to its total capacity.

NEWS IN BRIEF

Truck tire production at the various tire plants operated by U.S. Rubber is said to have been increased substantially with the adoption of the new 2200 denier rayon method of construction recently developed by that company.

Panther-Panco Rubber Co., Chelsea, Mass., has adopted the name "Suedex" for its new line of velvet textured soles for sport and utility wear. The new soles have a high synthetic rubber content and are said to be non-marking.

Plans for the volume production of aluminum metaphosphate in the post-war era have been announced by the Monsanto Chemical Co. Among other products, glass which transmits a substantially greater amount of ultra-violet light and its accompanying Vitamin D can be manufactured from this material.

Amalie B. G. Compound, a new lubricant specifically designed for use in mounting synthetic rubber inner tubes, has been introduced by the Amalie Division, L. Sonneborn Sons, Inc., New York City. The compound is of medium soft consistency, is made of pure vegetable oils, and does not contain ingredients that are injurious or cause deterioration of synthetic or natural rubber.

Reinhold Publishing Corp., 330 West 42nd St., New York 18, N. Y., has issued a revised edition of "Let's Look It Up," its catalog of books on science, technology, engineering, architecture, and related subjects. Indexes by titles and authors are used.

The name of the Catalytic Development Corporation, the research and service subsidiary of the Houdry Process Corp., has been changed to the Houdry Process Corporation of Pennsylvania. The change was made to identify the subsidiary more closely with the parent company.

Ear Wardens, which are designed to facilitate the hearing of orders in the presence of firing and protect ear drums by dampening objectionable noises, are currently being manufactured from neoprene by the Tyer Rubber Co., Andover, Mass. Special applicators to insert the "wardens" in the ears are also being made by the company.

Fabrilite plastic-coated fabrics, made with synthetic resin composition, which can be heat-sealed or readily cemented and which can be given "high" or translucent colors, have been announced by DuPont. Designs can be embossed on the surface of the fabrics.

Monsanto Chemical Co. has announced that it will soon begin volume production of melamine. Construction of a new melamine plant is under way at the Everett, Mass., factory of the company's Merrimac Division, where it is currently produced in pilot plant quantities.

Goodyear has reported that the Houston, Texas, copolymer plant it operates for the Government recently turned out its 100,000,000th pound of synthetic rubber. This plant was placed in operation in October, 1943, with a rated capacity of 60,000 long tons. It consists of 27 buildings on more than 52 acres.

The Quartermaster Corps in cooperation with industry has developed what are virtually "dust-proof" goggles. The frame, made of an oil-resistant synthetic rubber free from skin irritants, fits snugly and comfortably on the face, the soft rubber molding the frame to the contour of the face and keeping dust out. The lens, a single piece of shatter-proof plastic, is made flush to enable the soldier wearing the goggles to clear them of grit or mud with a single swipe of his sleeve.

For the second year, the highest award in the National Victory Garden Institute competition was given to the Manhattan Rubber Manufacturing Division of Raybestos-Manhattan, Inc., Passaic, N. J., in recognition of its distinguished record in the encouraging of Victory gardens and more food preservation.

Multiple V-Belt Drive Association, 140 So. Dearborn St., Chicago 3, Ill., has issued a primer-like presentation of the basic advantages of the multiple V-belt drive in a 16-page booklet entitled "19 Reasons Why It Is the Dominant Drive of Industry."

U. S. Rubber has announced that it is producing a flexible hydraulic hose that sends out a stream of water powerful enough to rip the bark off a log. Braided with wire and specially fabricated to withstand powerful pressure, the hose is attached to a de-barking machine. Two jets of water spurt from nozzles mounted on a mobile carriage and so great is the pressure that the nozzles must be kept moving constantly to prevent the water from boring a hole through the log.

A heavy duty, acid-proof apron, 35 by 47 inches, full, and weighing 1¾ pounds, made with a treated fabric combined with a new plastic by a special calendering process which impregnates the fabric so the product is acid-proof throughout, has been announced by Goodrich.

Schulman Adopts New Insignia

A. Schulman, Inc., Akron, has adopted an "Arrow S" design to symbolize the company's aims and achievements in serving the scrap rubber industry. The design, a capital "S" pierced by an arrow,

as per the accompanying illustration, will be used by the company to represent "the scientific skill that insures satisfaction in scrap rubber." The design has introduced a new motto for the company—"Be safe with Schulman." It is also intended to emphasize the importance of scientific sorting and select quality to reclaimers.

Goodyear Introduces Vitafilm

Vitafilm, a new lightweight, waterproof packaging and fabricating material, which also can be woven into fabrics, has been introduced by the Goodyear Tire & Rubber Co., Akron. The new material is a derivative of polyvinyl chloride. Currently being produced in six gauges of sheet form, Vitafilm is adapted for food bags, bowl covers, garment bags and other household purposes. Heat sealed or stitched, it is also suitable for umbrellas, raincoats and like products. For woven fabrics, it is cut into thin strips which are stretched and twisted into thread for the looms, after which it is woven like any fabric material, such as cotton or rayon.

Rubber Plant for Cuba

Plans for the immediate construction of a new rubber factory near Havana, Cuba, have been announced by the U. S. Rubber Co. Manufacturing will begin with the production of tire recapping materials and canvas shoes with synthetic rubber soles, commodities urgently needed in Cuba, but plans call for expansion into other rubber products as soon as possible. Approximately 150 will be employed.

Appointments at DuPont

Four appointments on the sales staff of the Pigments Department of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., have been announced. G. A. McCorkle is now assistant to the director of sales; W. R. Morpeth is sales manager of white pigments; J. W. Cronin is sales manager of dry colors; and J. A. Frederickson is manager of the central sales district, with offices in Cleveland, Ohio.

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Reclaimers Elect 1945 Officers

At a meeting of the board of directors of the Rubber Reclaimers Association, Inc., held in New York City on January 16 following the annual meeting of the Association, the following officers were elected for 1945: *President,* Jean H. Nesbit (U. S. Rubber Reclaiming); *Vice-President,* C. R. Shaffer (Xylos Rubber); *Secretary-Treasurer,* Charles T. Jansen. Directors named were David W. Bernstein (Panther Panco Rubber), Robert E. Casey (Naugatuck Chemical), C. R. Shaffer (Xylos Rubber), F. E. Traflet (Pequanoc Rubber), and G. K. Trimble (Midwest Rubber Reclaiming). Mr. Trimble was also named as chairman of the Executive Committee. Other committee chairmen named were: *Capacity*—C. R. Shaffer; *Scrap*—E. H. Brooks (Goodyear); *Membership*—D. S. Morse (Bloomingdale Rubber); *Advertising*—Allyn I. Brandt (Philadelphia Rubber Works); *Technical*—Fred Conover (Naugatuck Chemical).

Additional "E" Awards

Included among companies receiving the Army-Navy "E" award in recent weeks for production efficiency were the following:

Blue Ridge Rubber Co., Littlestown, Penna.

Cambridge Rubber Co., Cambridge, Mass.

General Tire & Rubber Co., North Union St. plant, Akron, Ohio.

Goodyear Clearwater Mills, Atco, Georgia.

U. S. Rubber Co., Winnsboro, S. C.

In addition, a second renewal star has been awarded to the Passaic, N. J., plant of the Manhattan Rubber Manufacturing Division of Raybestos-Manhattan, Inc., and to the Josephtown, Penna., smelter of the St. Joseph Lead Co.

Organize Polymer Division

Organization of a separate division of polymer chemistry under the direction of Dr. Herman F. Mark, who has been Professor of Organic Chemistry for the past five years, has been announced by the Polytechnic Institute of Brooklyn, Brooklyn, N. Y. The move followed the establishment of a Highpolymer Research Bureau by the Institute. According to the announcement, Polytechnic Institute is the first educational institution in the United States to set up a complete division for polymer chemistry.

Cancel ASTM Committee Week

After consultation with the War Committee on Conventions, the American Society for Testing Materials has cancelled A.S.T.M. Committee Week which was to have been held in Pittsburgh, Penna., during the week of February 26. The Spring Meeting, which was scheduled for February 28, has been indefinitely postponed. The meeting was to have featured a Symposium on Corrosion Prevention.

FINANCIAL NEWS

Armstrong Rubber Co.

Year Ended Sept. 30: Net income of $563,339, after provision of $389,433 for Federal income taxes, which is equivalent to $7.46 per share on outstanding stock and compares with $451,582 earned in the previous fiscal year. Net income from normal operations before deductions amounted to $1,023,658. The consolidated balance sheet as of September 30, 1944, showed total current assets of $2,968,642, including $781,555 in cash, $300,000 in U. S. Treasury bonds, $877,898 in trade acceptances and accounts receivables, $27,865 in other receivables, and $981,328 in inventories. This compared with total current liabilities of $1,060,372, which included $458,248 in accounts payable, $200,000 in notes payable, and $173,606 in accrued taxes. Total assets amounted to $6,124,970, as against $5,297,718 on September 30, 1943.

Resistoflex Corporation

Six Months Ended Dec. 31: Net profit of $28,174, which compares with $14,761 for the 1943 period. Net sales amounted to $1,125,268, the highest for any six months since the inception of the business in 1936, which compares with $776,347 reported for the last six months of 1943 and with $1,779,150 for the year ended June 30, 1944.

Rome Cable Corporation

December Quarter: Net profit of $144,040, equal to 76 cents a share, which compares with $125,069, or 66 cents a share, reported for the corresponding quarter of 1943. For the nine months to December 31, 1944, net profit amounted to $402,662, or $2.12 a share, after provision of $1,715,100 for taxes.

All-Rubber Arctic Overshoe

A new all-rubber arctic overshoe has been developed by the Quartermaster Corps to replace the former cloth top overshoe, which has now been designated as "limited standard." The new overshoe is more waterproof, easier to clean and more durable than its cloth top counterpart. It is made over a new standard Army last and is higher than the cloth topped model, being 13½ inches from the bottom of the sole to the top. Due to its greater height, it will be fastened with five buckles instead of four as was the former cloth top overshoe. The manufacture and procurement of the new all-rubber model is expected to begin in March.

New Synthetic Rubber Latex

A new synthetic rubber latex, a modification of the butadiene-styrene type of synthetic rubber, has been developed by the U. S. Rubber Co. and is already in production at the plant operated by that company at Naugatuck, Conn., for the government. The new latex is said to feature greater uniformity, in addition to easier handling and shipping. It mixes well with other ingredients and is therefore very easily compounded for uniform viscosity and other desired properties. Superior properties are claimed for the latex in saturating paper and fabrics for shoe parts and other artificial leathers, in the backing of pile fabrics for upholstery and carpet manufacturing, and in binding vegetable fibres and animal hair for the cushioning of combat tanks, parachute seats and backs, and upholstery. The special properties also are of value in the solutioning or dipping of tire cord with synthetic rubber latex.

Reclaiming of Vulcanized Balata

What is believed to be the first satisfactory method for the reclaiming of vulcanized balata is incorporated in U. S. Patent No. 2,361,015, recently awarded to Paul J. Dasher of the B. F. Goodrich Co., Akron. The process, according to the patent, consists of heating vulcanized balata in the presence of a polyamine, such as ethylene diamine, tetraethylene pentamine, or diethylene triamine, for periods ranging from 20 minutes to 24 hours at temperatures varying from 200° to 400° F. From 0.5 to 15 parts of the polyamine are used for each 100 parts of vulcanized balata.

Rubber from Johnson Grass

U. S. Patent No. 2,366,396 was recently granted to Edward D. Hallett, of Phoenix, Arizona, covering a process for making rubber from the juice of Johnson grass (Arabian millet), a pest weed whch grows widely throughout the western and southwestern United States. The weed matures from seed in about 60 days and if planted and harvested as a crop, five crops a year could be grown. The patent specifically covers a method of crushing the weed in a roller press and transforming the resultant juice into vulcanizable rubber.

Urquhart Heads Wilmington Chemical

G. Gordon Urquhart, formerly vice-president of National Foam System, Inc., has been named president of the Wilmington Chemical Corp., New York City, succeeding Herbert Waller who recently resigned. Henrik J. Krebs, who has been secretary, has been named treasurer of the company, succeeding A. D. Bestebreurtje, also resigned. Edmond du Pont and Edward V. Osberg continue as vice-presidents.

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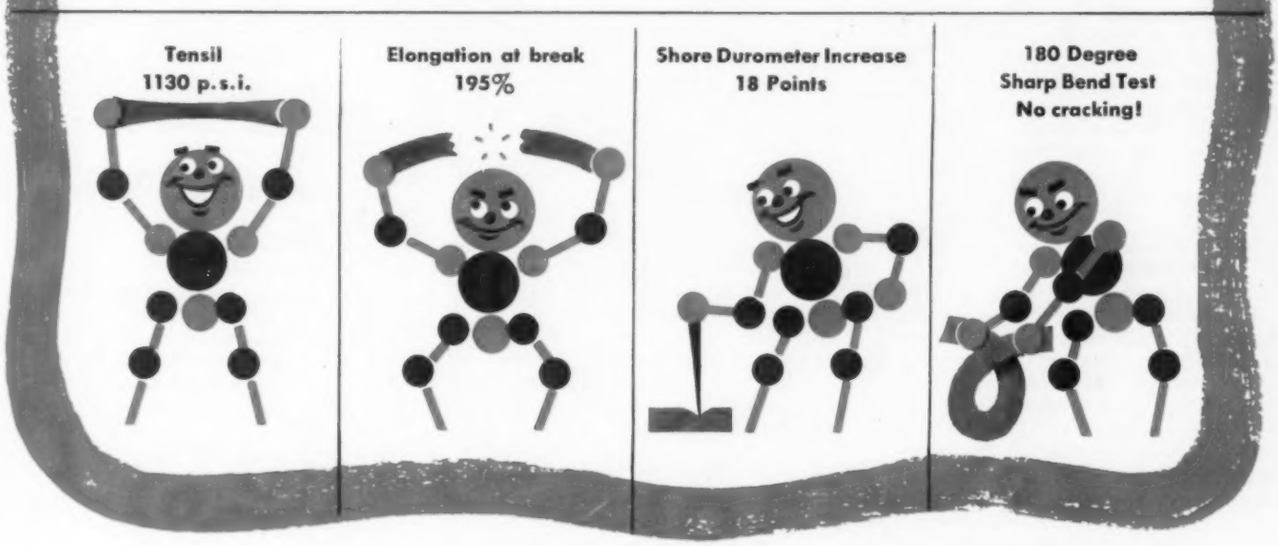

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Elongation at break percent		830
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Oven Aging at 300°F.	45 hours	70 hours
Tensile psi	1510	1130
Elongation at break percent	310	195
Shore Durometer increase	13	18
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LOS ANGELES NEWS

The annual Boy Scout night of the Los Angeles Rubber Group, Inc., held in the Mayflower Hotel on February 6, drew an attendance of 158, of which 48 were guests. A number of the members brought their own sons. The program planned especially for the Boy Scouts, was enthusiastically received.

Arthur Schenk, chief Boy Scout executive of the Los Angeles Council, Boy Scouts of America, gave the main address. He emphasized the great importance of scout work prior to this war and stated that millions of former Boy Scouts are now fighting in the Allied armies. "Only two nations refused to send representatives to the worldwide Boy Scout meeting in England thirteen years ago, and those two were Germany and Japan," said the speaker. He emphasized also the work of the Boy Scouts in France following the invasion by the Allied armies last June. Mr. Schenk's talk was well received.

A display of model airplanes was shown and a talk on these models given by William L. Butler, district commander of the Air Scout Centinella Council, Boy Scouts of America, and also vice-president of the National Model Airplane Association. He is connected with the naval aeronautical and aerodynamic engineers of the North American Aircraft Corporation.

A talk on the origin and basis of rhythm in the music of the tropical areas was given by Thurston Knudson, a man who has spent years in those areas making this study and who has supplied the sound effects in a number of moving pictures. Mr. Knudson made his talk emphatic and understandable by the use of drums which he brought from tropical countries in different parts of the world. Another feature was a moving picture showing the processes of building the B-29, the world's largest bomber plane.

W. E. Hutchinson, the new chairman, presided for the first time and introduced the guests. Mr. Hutchinson has been active in the Group's work for many years.

Prizes donated by H. Muelstein & Co., Inc., and the Plastic and Rubber Products Company, plastic items for the most part, were won by John Huff, Herbert Berg, Robert Nagle, Robert Vonder Reith, Lim Yee, H. F. Parkinson, Sr., and Mason Paine. A War Bond, donated by the Group itself from the treasury, was won by Mr. Hutchinson, and he in turn presented it to the Boy Scouts of America.

A technical study meeting was held in the same room prior to the evening meeting. A report by the treasurer showed the Group to be in excellent financial condition.

Los Angeles daily newspapers recently announced the gift of $1,500 by T. Kirk Hill of the Kirkhill Rubber Company for the remodeling of the building on a 240-acre ranch recently donated by Mrs. Clara Stanley to the Wood Rangers for use as a boys' camp. The Wood Rangers, organized originally by Ernest Thompson-Seton, is a national boys' association, and in Glendale, California, near which the ranch is located, it is a Community Chest agency. The camp, situated in a canyon, will be known as Stanley Camp.

The Mitchell Tire and Rubber Company, 2110 San Fernando Road, recently was purchased by the Huntington Rubber Company, 4010 Whiteside Street. The Grizzly Manufacturing Company was recently purchased by the Thermoid Company of Trenton, N. J.

Ferd Bonsted of the Binney and Smith Co., N. Y., recently spent some days in Los Angeles and San Francisco calling on the trade.

Montel ("Monty") Montgomery, local representative of various companies, has returned from a trip east. The purpose of the trip was to attend a meeting at the plant of Sharples Chemicals, Inc., Wyandotte, Michigan, where various new chemical products for use in the rubber industry were shown and discussed. Mr. Montgomery found this trip both interesting and instructive. He also went on to Pittsburgh, New York City, and Chicago.

Bob Abbott (sometimes known as "First-in-the Book" Abbott, because that "A-B-B" beginning of his name causes it, like the name of Abou Ben Adhem, to "lead all the rest") is a happy man these days. His Son, Bob, Jr., in the Aleutians for what has seemed an endless time, was due for his first furlough home early in February.

Stokes Royal, son of Ed Royal, who put in a few years in the service driving ambulances in such distant spots as Egypt, India, and other tropical areas, attended the Rubber Group meeting in February and pronounced himself satisfied with California but glad to have had his worldwide experience.

The new Year Book, which will be an enlargement over the book published last year by the Los Angeles Rubber Group, was still on the press at the time of the February meeting. The hope was to distribute it at the March meeting. Incidentally, plans for the summer outing of the group for 1945 are already being discussed.

F. H. Banbury, creator of the Banbury mixer, is spending the winter in Los Angeles, and was a visitor at the February meeting of the Los Angeles Rubber Group, of which he is a member.

Vic Vodra (Vanderbilt) is back from a trip East that occupied more than two weeks and which, enroute back and forth, brought some hardship. In getting back, trains, planes and foot power were all used. The trip took Mr. Vodra to the Vanderbilt laboratories in Connecticut.

Glyco Products Co., Inc., Brooklyn, N. Y., has issued the 1945 edition of its "Chemicals by Glyco" catalog. A number of additional items are described, as well as the usual esters, synthetic waxes, emulsifying agents, etc. Copies are available on request to the company.

Substantial price reductions on Marbon S and S-1 resins have been announced by the Marbon Corp., Gary, Indiana. Both materials are now available at 75c a pound in less than 500 lb. lots and 65c a pound in lots of 500 lbs. or more. Masterbatches of both materials with GR-S or GR-M can also be secured from the company.

"Rubber Rancho Grande," the government-owned synthetic rubber plant at Port Neches, Texas, which is operated by Goodrich, produced 44,643 long tons of synthetic up to November 5, according to Goodrich officials. A record total of 1,000,000 man-hours was chalked up without a lost time accident for any member of the plant's personnel.

Johnson & Johnson, New Brunswick, N. J., manufacturer of surgical dressings, has taken an option on a 14½-acre tract in Cranford, N. J., as the site for a plant expected to cost approximately $250,000.

Apollo Chemical Co., Inc., has announced the opening of offices at 51 East 42nd St., New York 17, N. Y., to engage in the buying and selling of chemicals, oils, waxes, resins, gums and other chemical raw materials.

A gas mask to protect head wound patients from war gas, the first such device which affords protection to patients with bandaged heads, faces or jaws, has been developed by the Chemical Warfare Service. Known as M7-11-9, the mask is in production at the Bennington, Vermont, plant of the National Carbon Co., and the Fall River, Mass., plant of the Firestone Rubber & Latex Co.

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CANADIAN NEWS

In a statement issued on January 10 by the Rubber Association of Canada, J. A. Martin, deputy rubber controller of the Department of Munitions and Supplies, warned that increased production of military tires must take precedence "over all other considerations."

At a meeting at the Association's offices in Toronto, Mr. Martin told executives of Canadian tire companies he hoped it would be possible to produce additional military tires without cutting down production of tires for essential transportation needs in Canada.

However, in view of General Eisenhower's warning that a military tire shortage might prolong the war in Europe, Mr. Martin said it was necessary to meet the call for military supplies without delay. He said steps to provide material and equipment necessary for stepped-up production already had been taken.

Rumor that the big drive to speed up production of military tires is merely a camouflage to stimulate the workers in getting out civilian tires has been emphatically denied by A. W. Hopton, vice-president and general manager of the Dominion Rubber Co., Ltd., and George W. Sawin, president of the B. F. Goodrich Rubber Co. of Canada, Ltd. "Men who spread a rumor of this kind to the encouragement of absenteeism in the plants are dangerously sabotaging the war effort," Mr. Sawin said. "Our company is making tires and all rubber products directly under Government control. Our production is scheduled by the Government and we are following that schedule as a matter of compulsion."

"It is true," he said, "we are producing civilian tires, but only for essential purposes. We are told by the Government what we are to turn out. It stands to reason essential civilian tire supplies have to be kept rolling the same as military supplies. We have to have tires for trucks and other motor vehicles used in moving military supplies. This rumor is certainly damaging and those who spread it are acting either consciously or unconsciously as saboteurs. The sooner this rumor is killed the better for our war effort."

Annual report of Sieberling Rubber Company of Canada, Ltd., shows net profits of $55,550, or $1.45 a share, for the year ended October 31, 1944. This includes refundable tax of $23,600. Tax provision, exclusive of refundable portion, was $119,400. Balance sheet as of October 31, 1944, shows current assets of $1,803,111, including $757,815 in cash and $100,000 in Dominion bonds, against current liabilities of $797,655, indicating working capital of $1,005,458. These figures compare with current assets of $1,367,726, current liabilities of $1,376,954, and a working capital "deficit" of $9,228 on October 31, 1943. For the year ended October 31, 1943, net profit was $64,213, or $2.05 a share, including $36,700 refundable tax. There are 31,315 no par value shares outstanding. Tax provision, exclusive of refundable portion, was $167,300.

Seven-day week production of tires began on January 14 at the B. F. Goodrich Company of Canada, Limited, at Kitchener, Ont., according to George W. Sawin, president. A. W. Hopton, vice-president and general manager of the Dominion Rubber Co., stated at the time that Dominion was also going on a seven-day week shortly.

Tremendous improvement has been effected in a remarkably short time in the technique of synthetic rubber production, R. C. Berkinshaw, president of the government-owned Polymer Corporation of Sarnia, Ont., and president of the Ontario Motor League, said on January 26 in an address to the annual meeting of the Hamilton (Ont.) Automobile Club. Mr. Berkinshaw held out no hope of the average motorist receiving new tires until at least after the war in Europe is finished, but he declared, "we have licked the problem and we are not in the least worried over the rubber outlook."

Research into insulation, with the object of developing smaller and lighter electrical equipment, the copper components of which will operate safely at higher temperatures than now are possible, is one of the projects engaging the attention of the National Research Council's electrical engineering department. B. G. Ballard, of the electrical engineering staff, said in an interview that the Department also is investigating the properties of synthetic rubbers in electrical applications and cooperating with manufacturers in the development of suitable synthetics.

The Engineering Institute of Canada has awarded the Ernest Marceau Prize to Andre Leclerc, of the Dominion Rubber Co., Ltd., St. Jerome, Quebec. Mr. Leclerc was born in Montreal in 1920 and in May, 1944, received his B.Sc. in general engineering from the University of Montreal. He also received the medal of the Lieutenant-Governor of Quebec for being the first for five years in his course at Ecole Polytechnique of the university and also the medal of the Association des Anciens Elèves de Polytechnique for heading the class in his fifth year.

Paul Sherman Smith, head of the legal department of the Dominion Rubber Company, Limited, and director of the company's industrial and public relations division, has been appointed King's Counsel. Mr. Smith is one of the representatives of the Canadian Manufacturers' Association, Montreal City Council.

D. W. Ambridge, who was vice-president of the Polymer Corporation, Ltd., has been appointed third vice-president and assistant general manager of the Ontario Paper Co., Ltd., and the Quebec North Shore Paper Company.

Phillip E. Temple, retired sales manager of the Dunlop Tire and Rubber Goods Co., Ltd., died on January 15 at his home in Montreal. He entered the service of the company in 1906 and retired in 1933. His wife and an airman son overseas survive.

A rumor is current that the Northern Rubber Co., Guelph, Ontario, which discontinued rubber manufacturing a few years ago, may resume the production of rubber novelties and specialties in the post-war period. No confirmation of the rumor could be secured.

Output of synthetic rubber in Canada's $51,000,000 Government-owned Polymer Corporation plant at Sarnia, Ont., reached a peak rate of more than 93,000,000 pounds per annum in May, 1944 (11 per cent above original estimated capacity), and the present rate is 87,000,000 pounds, consisting of 78,000,000 pounds of Buna S and 9,000,000 pounds of Butyl. Production for the year ended September 29, first year of operation, comprised 58,000,000 pounds of Buna S and 2,000,000 pounds of Butyl rubber.

In peacetime the rated plant capacity of 34,000 tons of Buna S and 4,000 tons of Butyl would be sufficient to meet all Canadian requirements, even after allowing for postwar expansion of industry and exports of finished rubber products. The postwar era will see a vast abundance of rubber. In part this will be neutralized by the great replacement demands which industries which have been dormant during the war will make to catch up. There will also be tremendous new demands in homes, automobiles, clothing and aviation development. Rubber flooring, mattresses, wallpaper, weather stripping and clothes are but a few of the future uses.

Permit controls on the importation of manufactured rubber goods have been removed, the Revenue Department announced on December 30. Import permits still are required for natural and synthetic rubber not processed into goods.

A new chemical formula, Hydrosulphosol Ointment, for the treatment of painful burns, is being introduced to industry by the Davis Emergency Equipment Co., Newark, N. J., after six years of extensive clinical tests.

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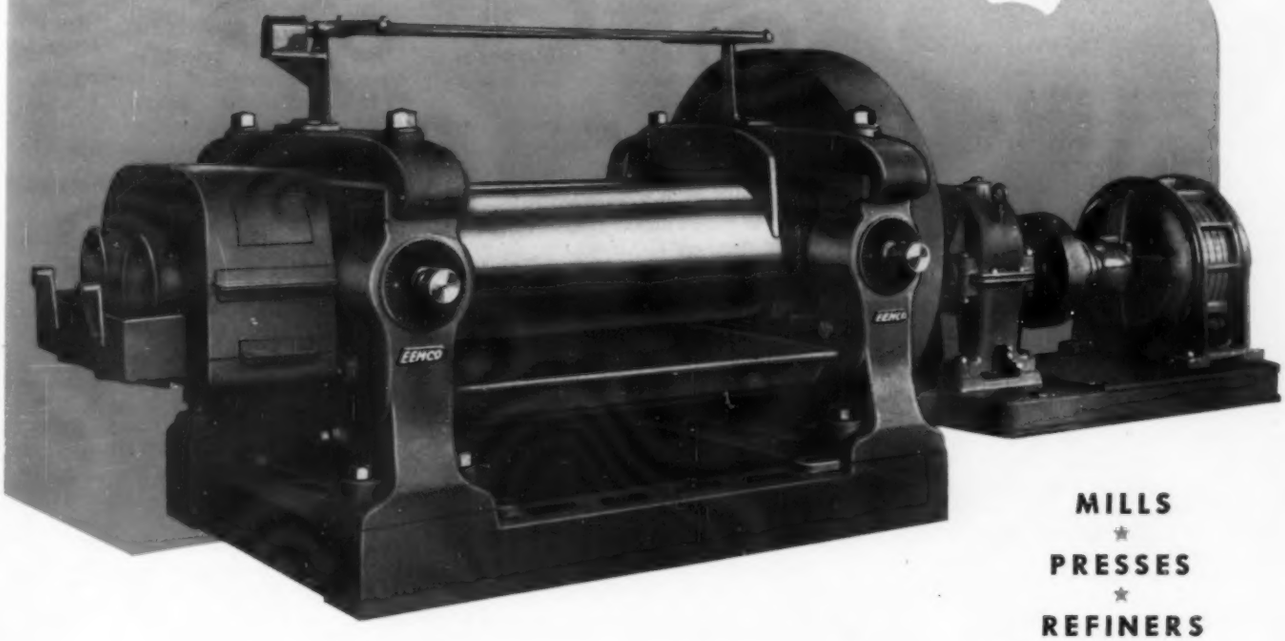

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OBITUARIES

Charles E. Brown

Charles Edward Brown, executive vice-president of the Okonite Co., Passaic, N. J., died in Chicago, Ill., on January 13, at the age of 79. Associated with Okonite for the past 20 years, he was widely known throughout the railroad, electric utility, industrial and wholesaling fields. In 1943 the National Electrical Manufacturers Association presented him with a citation and Fifty-Year Certificate because of his long and untiring service as a pioneer in the electrical industry.

Born in Philadelphia, Penna., on July 15, 1866, Mr. Brown started his long business career in Chicago with Marshall, Field & Co. in 1884. Five years later he became associated with the McKinlock brothers as vice-president and part owner of the Central Electric Company, one of the earliest and largest of the electrical wholesale organizations in the United States. His experience as a distributor of Okonite wires, cables and tapes led to his joining the Okonite Company in 1925 as executive vice-president in charge of all sales through the Middle West. He had been an Okonite director since 1919 and continued in this capacity until his death. During the same period, he was also a vice-president and director of the Okonite-Callender Cable Co., Inc.

Active in civic affairs for many years, Mr. Brown had served on the Board of Governors of the Chicago Opera Co. and the directorate of the Chicago Boys' Clubs, Inc., serving as president of the latter organization from 1938 to 1940. He was also a trustee of the Chicago Music Foundation and a director of the Wacker Corp. He helped to establish the Electric Club in Chicago and served as its president for many years. His social contacts included membership in the Chicago and Old Elm clubs and the Shoreacres and Onwentsia golf clubs.

Mr. Brown is survived by his widow, two sons and a daughter. One son, C. E. Brown, Jr., is a vice-president of the Okonite Co. in charge of the Washington, D. C., office.

William H. Waldron

William Hubell Waldron, vice-president and director of the John Waldron Corporation, New Brunswick, N. J., died at his home in New Brunswick on February 1 in his eightieth year. Born in New Brunswick in 1865, Mr. Waldron was the grandson of William Waldron who founded the business in 1827 and the son of John Waldron for whom the present corporation was named. He joined the company in 1885 after being graduated from Rutgers University and was active in its management until 1924 when the present corporation was formed. Mr. Waldron was a life trustee of Rutgers and at one time served as a vice-president of the university. He was also a director of the National Bank of New Jersey and of the Interwoven Stocking Co. among others, and served as manager of the New Brunswick Savings Institution. His memberships included the A.S.M.E., Franklin Institute, University Outing Club, Union Club of New Brunswick, and the Holland Society. A widow survives.

Harry O. Chute

Harry Owen Chute, chemical engineering consultant, recognized as one of the foremost wood distillation chemists, died recently at Brentwood, N. Y. Mr. Chute was also well known for his work in rubber reclaiming, waste recovery, evaporator design and distillation in general. Born in Evansville, Indiana, in 1867, Mr. Chute was graduated from Columbia University (now George Washington University) in 1887 as an analytical chemist. During his lifetime he was associated with the Illinois Steel Co. and the Southern Chemical Co. among others.

John F. Hahn

John Frederick Hahn, who was secretary-treasurer of the Allcock Manufacturing Co., producers of adhesive plaster and other surgical specialties at Ossining, N. Y., for many years prior to his retirement about eight years ago, died in a hospital in New York City on January 25 at the age of 72. Born in New York, Mr. Hahn was educated in private schools and spent all of his business career with the Allcock concern. He was a veteran of the Seventh Regiment and had been a major in the 165th Regiment of the New York National Guard.

John D. Carberry

John D. Carberry, who was associated with the U.S. Rubber Co. as an assistant secretary-treasurer for many years until his retirement in 1921, died on January 14 in the White Plains (N. Y.) Hospital at the age of 75. Death followed a brief illness. Mr. Carberry made his home in Pelham Manor, N. Y.

Technologists Still Needed

The Civil Service Commission has announced that the need for technologists in Government service continues and that vacancies exist in Washington and throughout the country in such agencies as the War and Navy Departments, the Department of Agriculture, and the Department of the Interior. The salaries range from $2,433 to $6,288 a year, including overtime pay.

Technologists are especially desired who have had experience in testing, development, or production in the following industries: Coal, food, fuels (liquid), paint, varnish, and lacquer, petroleum, synthetic resins and plastics, electrochemical, and process metallurgical. There will be no written test. For the lower grade positions, at least 3 years of experience in technology is required, unless appropriate education is substituted. Additional professional experience is necessary for the higher grades. There are no age limits.

Interested persons may secure copies of the announcement of these positions at the nearest first- or second-class post office, or by writing direct to the U. S. Civil Service Commission, Washington 25, D. C. The announcements contain complete information regarding the requirements and duties of the positions, and instructions for applying. Federal appointments are made in accordance with War Manpower Commission policies and employment stabilization programs.

Swedish Situation Serious

According to a report from the U. S. Bureau of Foreign & Domestic Commerce, the rubber shortage in Sweden remains serious and little hope is held for complete relief from the situation until considerable quantities of synthetic rubber can be imported from western countries or until supplies of natural rubber in the East are once more available. German shipments of buna in 1943 were far short of agreed amounts and experimental plantings of kok-saghyz were largely a failure. The neoprene plant at Ljungaverken has been in production for some time, and while it was understood that additional facilities for doubling capacity would not be constructed until results were definitely established, press reports indicate that construction on new installations has begun. Output from this plant is not expected to relieve the situation materially, however, and every effort is being made to conserve tires and tubes.

Acquires Tagliabue Concern

The Portable Products Corporation, Pittsburgh, Penna., has acquired the assets of the C. J. Tagliabue Mfg. Co., Brooklyn, N. Y., one of the pioneers in the manufacture of industrial control and laboratory instruments. The business will continue to be operated as a separate division of the Pittsburgh concern.

NEVILLE

NEVOLL*

GR-S Synthetic Rubber Softener

*REG. U.S. PAT. OFF.

● NEVOLL*, a coal-tar softener, is finding considerable use as a softener and plasticizer for the new GR-S (Buna S) synthetic rubber.

● It meets the Rubber Reserve Company's Contract Specification for coal-tar softener dated Nov. 21, 1942.

● NEVOLL* is currently quite readily available for prompt shipment in tank cars and drums.

Ask for a sample and further information from us or our agents

THE NEVILLE COMPANY

PITTSBURGH · PA.

Chemicals for the Nation's War Program

NEVILLE SALES AGENTS TO THE RUBBER INDUSTRY

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R-8

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Since originating the Capitol Process Liner Treatment, we have processed many million yards of cotton piece goods for all types of rubber companies.

These millions of yards of Capitol Liners have given efficient service for two reasons. First, we have usually finished a sample liner without charge so it might be tested on the job and thus ascertain its suitability for the purpose in mind. Second, production and repeat orders are always processed to the same uniform quality standards.

These millions of yards have resulted in untold economies in cotton piece goods. Liners processed with our Capitol Treatment have a considerably longer life than those not treated. Therefore, purchases of piece goods have not had to be made so frequently and thus many, many yards of cotton goods have been made available for other vital War needs. Capitol Liners longer life means that over a period of time, they literally "pay for themselves."

If you have not yet tried treated liners, why not consult us regarding a trial treatment on some of your liner material. We are always at your service and an inquiry or order will have our prompt attention.

•

TEXTILE PROOFERS, INC.

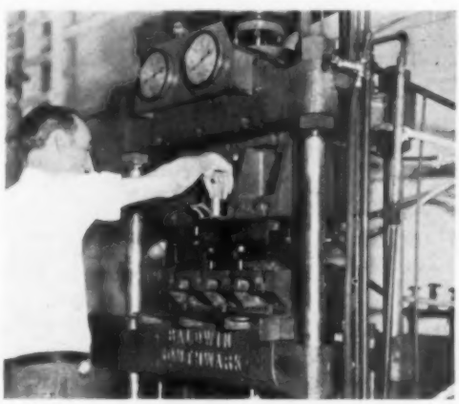
181-193 Culver Ave., Jersey City 5, N. J.

Originators of the Capitol Process Liner Treatment

NEW EQUIPMENT

Baldwin Hydraulic "Hyspeed" Press

Baldwin Locomotive Works, Philadelphia 42, Penna., has developed a vertical hydraulic "hyspeed" press for molding plastics. The new press, heralding the company's entry into the field, utilizes electronic heating. The first experimental model, illustrated herewith, is a 75-ton molding press which can be used for both compression and transfer molding. It has a hydraulic plunger on top which is used for forcing the preheated material into the mold. In straight compression molding this cylinder is not operated. The unit is operated with a self-contained oil pump, located on the side. According to Baldwin, the new units will be available in capacities of from 50 to 300 tons and will be operated either directly from an accumulation system or by means of separate self-contained, motor-driven pump units.



Inserting plastic wafers in the new Baldwin-Hydraulic Press

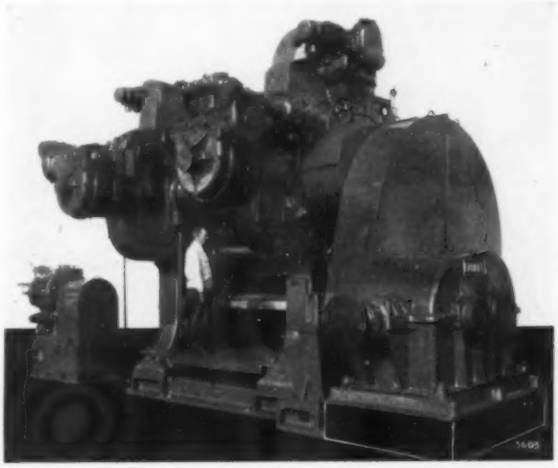
Although few details of the new "hyspeed" press have been made available, it was stated that experiments have been conducted for months on resins, ureas and melamines. The Bryant Electric Co., which cooperated in the development, reports that workmen have been able to turn out 20% more pieces from an experimental six-cavity mold as were previously turned out from a standard 24-cavity compression mold. Squeezing the preheated plastic into the mold, combined with changes in mold design, are said to make high-speed thermosetting molding practical.

Several important savings are claimed for the new Baldwin press. Since a smaller press is required, the initial investment is reduced, while the use of smaller molds means reduced maintenance cost. Mold life will be considerably longer, due to the reduction of pressure on the material molded, and materials that can be hobbed more readily can be used for mold construction. It is also pointed out that molded pieces can be made faster and that decided savings in "flash" can be recorded. The machine is also said to permit the use of substitutes or cheaper materials. In the accompanying illustration, a close-up of the new press is seen, with the plastic wafers being inserted.

Farrel-Birmingham Roll Calenders

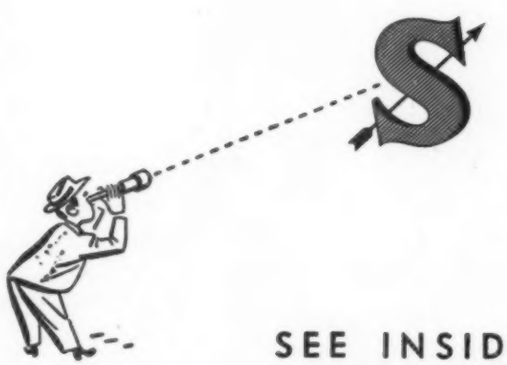
The two four-roll calenders shown in the accompanying illustration indicate the extreme range of sizes built by the Farrel-Birmingham Co., Inc., Ansonia, Conn., for the rubber and plastics industries. By way of contrast, the larger machine with 32-inch by 70-inch rolls weighs 250,000 pounds, while the smaller with 8-inch by 16-inch rolls weighs but 10,000 pounds.

The 32-inch by 70-inch calender is designed for double coating tire cord and for multi-pass sheeting and has several advanced design features which contribute to more efficient operation and higher product



quality. Individual motors provide independent operation of each adjusting screw, so that one end of the roll can be adjusted separately, or the screws can be synchronized for parallel adjustment. This provides precision control of gauge, either automatically or manually, with instant correction to maintain uniform thickness. This is one of the machines that are helping to expand the output of tires.

The 8-inch by 16-inch calender is designed primarily



SEE INSIDE BACK COVER

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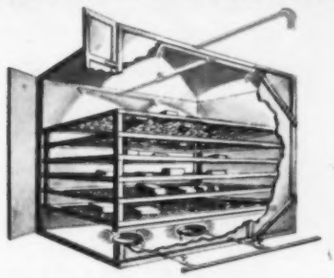
FIRE-FOG DRYER FIRES

-a Fire Test of Interest to Every Manufacturer



"Automatic" FIRE-FOG . IT BLANKETS . IT ISOLATES . IT QUENCHES .

The Time: Summer, 1944.

The Place: "Automatic's" Test Yard at Youngstown, Ohio.

The Occasion: A test to determine the fire protection value provided by FIRE-FOG for a Dryer.

Frankly, FIRE-FOG was "on the spot"—other fire protection methods had failed.

Conditions at the manufacturer's plant were simulated. A test oven was built; drying racks were made; pieces of material distributed over the racks. Gas Burners were lighted and the temperature brought up to the ignition point for the material tested and maintained for 15 minutes—*then* FIRE-FOG was introduced into the oven through FIRE-FOG Nozzles.

The result?—in only a matter of seconds the fire was extinguished! And only a few gallons of water had been used!

What has "Automatic" to offer you? "Automatic" service includes test, design, manufacture, and installation of the type of sprinkler system best adapted to extinguish YOUR fires. Write for complete information.

NOTE: In normal fire-fighting operations FIRE-FOG action is entirely automatic—it blankets . . . isolates . . . quenches—usually in a matter of seconds.

"Automatic" SPRINKLER CORPORATION OF AMERICA

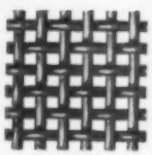
YOUNGSTOWN, OHIO . . . OFFICES IN 31 CITIES

LUDLOW SAYLOR

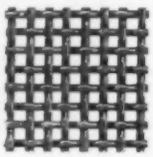
Precision Wire Cloths

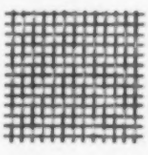
and Screens for Rubber Strainers, sifters, filters and similar process equipments.

We have been specialists for many years in the making of precision wire cloths, wire screens and woven wire products.

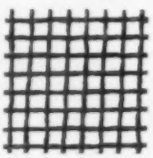


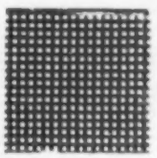
We apply our same precision principles in fabricating wire cloths into finished industrial units, for production or processing equipments or for permanent parts of countless industrial products.



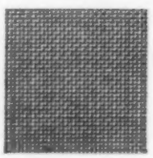


We invite your inquiries for wire cloths of all commercial metals or alloys or weaves, in continuous lengths or cut to size, or processed to meet your individual requirements.





We will follow your specifications and blue-prints exactly as your production engineers have prepared them—or we will submit suggestions for your approval.



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Galvanized	Double-Crimp	Brazing	Cones
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Copper	Selvage-Edge	Forming	Pieces
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Nickel	Stranded	Galvanizing	Ribbons
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		Gas-Welding	Template shapes
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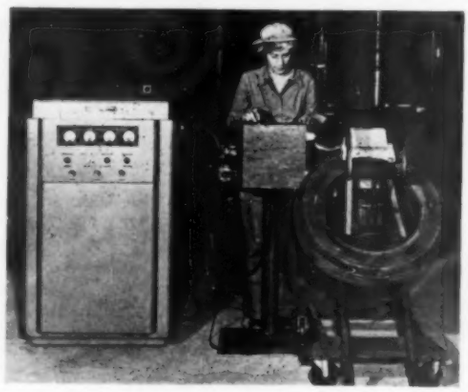
WIRE CLOTH BASKETS — TRAYS — UNIT-HANDLING FIXTURES — all sizes, styles, shapes, weaves, clinched or welded construction.
MADE TO INDIVIDUAL REQUIREMENTS.

for laboratory use, although it is also suitable for small production, especially of plastic materials. This size, like the larger, has three rolls arranged vertically, with a side roll opposite the top roll. The high base brings the calender to the proper working level and also provides space to enclose the drive, making the unit compact and completely self-contained.

Electronics Aid Tire Repair Work

In the accompanying illustration, one of the Wacs connected with the Air Technical Service Command at Wright Field, Dayton, Ohio, is seen repairing damaged truck tires by electronic heating methods. Using this apparatus, many kinds of vulcanizing can be accomplished in a small fraction of the time required by conventional steam installations. Since heat is developed in all sections of the rubber at the same time,



Electronic heater at left supplies high frequency energy for vulcanizer.

the finished patch has definite advantages since there is no danger of overcuring the surface in order to reach internal layers. The electronic heater that supplies high frequency energy for the vulcanizer in the photograph was developed especially by the North American Philips Co., Inc., of New York.

FOR GOOD ABRASION RESISTANCE, USE PHILBLACK A

(FOR FURTHER DETAILS, SEE AD ON PAGE 460)

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DEALERS AND BROKERS

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SYNTHETICS — PLASTICS

We Offer A Service

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Utility Crimper Type Flipper

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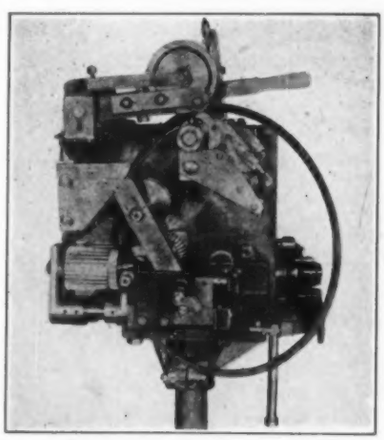

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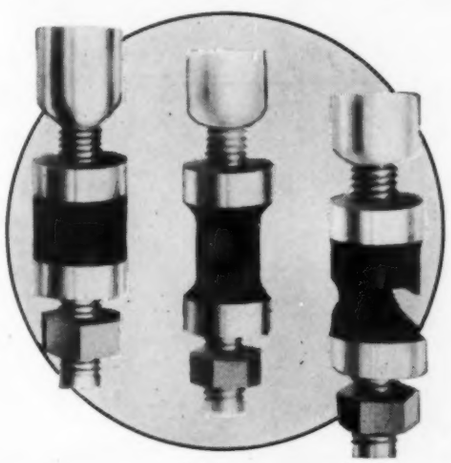
BRASS PLATING *use* REANITE

TO BOND RUBBER AND SYNTHETIC RUBBER TO METALS

With Reanite you can forget slow, costly brass plating in rubber-to-metal adhesion. Merely substitute two quick-drying coats of Reanite cement for the brass plating operation and proceed as usual. Follow your standard practice for curing time, pressure and temperature. *Reanite bonds will prove stronger than the rubber itself!*

Reanite will bond natural rubber or Buna S with practically integral adhesion to steel, aluminum, magnesium, copper, in fact almost any metal.



THE U. S. STONEWARE CO.

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Please send me full information, without obligation, on the Reanite Process for bonding rubber-to-metal.

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VULCANIZED VEGETABLE OILS

—RUBBER SUBSTITUTES—

Types, grades and blends for every purpose, wherever Vulcanized Vegetable Oils can be used in production of Rubber Goods—be they Synthetic, Natural, or Reclaimed.

A LONG ESTABLISHED AND PROVEN PRODUCT

THE CARTER BELL MFG. CO.
SINCE
CARTER BELL PRODUCTS
1903
SPRINGFIELD, NEW JERSEY

Non-Electric Magnetic Separators

A complete line of non-electric permanent magnetic separators, many of which are used in the rubber industry, including polymer and reclaiming plants, is featured by the Eriez Manufacturing Co., Erie, Penna. These separators require no wiring, are light and compact, easy to install, with the magnetism lasting indefinitely. Special styles are available for installation on wood or steel. When installed on a wood or steel conveying unit, an opening is cut in the bottom the same size as the magnetic unit and the unit is then fastened

with bolts. Good results can also be obtained by suspending the unit over the material as it passes by.

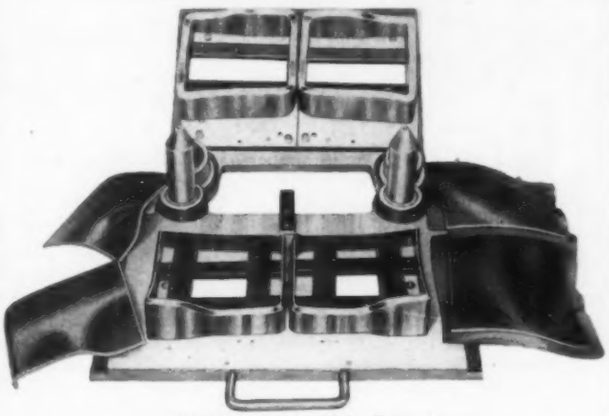
A hinged type magnet is recommended for use on a covered spout, swinging down from the spout for the removal of accumulated metal. Length of the magnet required in such cases is determined by the outside width of the spout. When used on steel installation, the Eriez magnet is insulated with brass or copper to prevent the heavier steel feed table, chute or hopper from absorbing the magnet's strength. Large sizes can be furnished by using combinations of unit magnets. The company also supplies magnets for removing metals from liquids.

SEE INSIDE BACK COVER

DIC

SHARP EDGE CUTTING DIES

Also TOOLS, DIES, JIGS, FIXTURES and MACHINE PARTS



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Now Engaged in Prime and Subcontract Work—Defense and Civilian

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PROCESSING EQUIPMENT

Sifters, Crushers, Cutters, Dry and Liquid Mixers, Mills, Grinders, Pulverizers, Conveyor Systems, Complete Installations.

The handling equipment construction "know-how" of the Mercer Engineering Works, Inc., Clifton, N. J. . . . The more than 40 years processing equipment experience of Robinson Mfg. Co., Muncy, Pa. . . . All are embodied in and represented by

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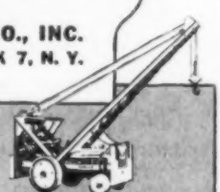


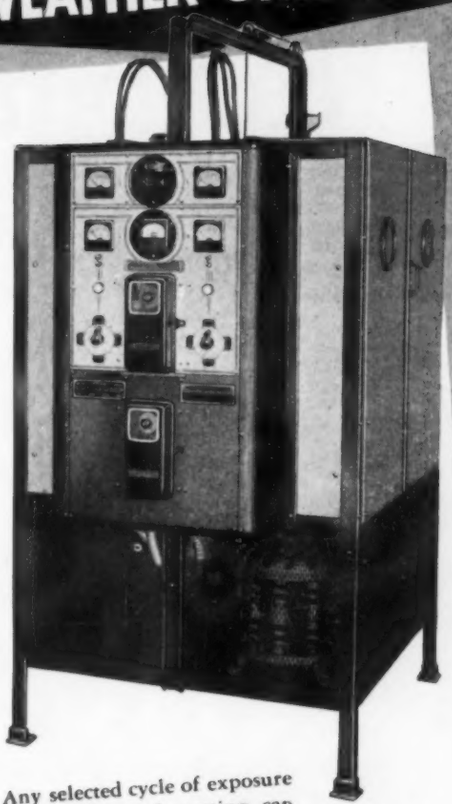
Materials

HANDLING EQUIPMENT

Trailer Trucks (All Types) Wheel Tractor Cranes (3 to 7 ton) Fork Lift Trucks, Lift Platforms, Hoists, Live Skids, Wheels, Casters.

Weathering qualities of RUBBER PRODUCTS determined with reliable accuracy in the

ATLAS *twin arc* WEATHER-OMETER



Any selected cycle of exposure to sunlight and wetting can be set for automatic continuous testing in the Weather-Ometer. Exact tests can be duplicated at any time by settings on the control panel which contains temperature regulator—time meter—light and water cycle switch — automatic cut-off switch — voltage adjusting switch — direct reading thermal regulator — reactance coil (for economical current consumption). The Weather-Ometer is fully automatic in operation; can be left unattended over night; only necessary to renew carbons once in 24 hours. Years of exposure to any conditions of weathering reduced to a few days testing in the laboratory with the Weather-Ometer.

Originators and sole manufacturers of accelerated testing machines for over a quarter of a century. Fade-Ometer, Weather-Ometer, Launder-Ometer — the accepted standard testing machines used all over the world.

ATLAS ELECTRIC DEVICES CO.

361 West Superior Street, Chicago 10, Illinois

THE INTERNATIONAL
RUBBER REGULATION COMMITTEE

gives a brief account of the Rubber Industry and the problems it has faced and overcome in peace and war.

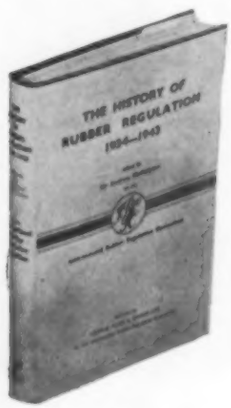
THE HISTORY OF

Rubber Regulation

1934-1943

EDITED BY

Sir Andrew McFadyean



"This book surveys early voluntary rubber control schemes and submits the facts and an interpretation of them concerning the formulation and operation of the International Rubber Regulation Agreement. It reveals the problems encountered in drawing up a restrictive plan acceptable to many nations and in its administration from 1934-1941. About 50 pages are given to a description of the committee's work covering the seven-year period of control. An appendix of about 100 pages contains the texts of the agreement and of the subsequent American Reserve Stock Agreements and statistical information of production, consumption, prices, and planting and production costs." — *India Rubber World.*

At all bookstores $3.25

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REVIEWS

BOOKS

Symposium on Plastics. Published by the American Society for Testing Materials, 260 So. Broad St., Philadelphia 2, Penna. 6 x 9 in. 200 pp. Price to Members: $1.25 (paper cover), $1.50 (cloth cover); To Non-Members: $1.75 and $2.00, respectively.

Latest information on a number of important problems in the field of plastics is provided through this extensive symposium which was sponsored by the A.S.T.M. Philadelphia District Committee at meetings held late in February, 1944, in conjunction with the spring meetings of Committees D-9 on Electrical Insulating Materials and D-20 on Plastics. All of the papers are of definite interest in connection with the fields covered and all are considered as definite technical contributions. Papers covered, and their authors, include the following:

Heat Resistance of Laminated Plastics, E. O. Hausmann, A. E. Parkinson and G. H. Mains; *Effect of Environmental Conditions on the Mechanical Properties of Plastics,* T. S. Carswell and H. K. Nason; *Diffusion of Water through Plastics,* George Deeg, Jr., and Carl J. Frosch; *Stiffness and Brittleness Properties of Nonrigid Plastics,* R. F. Clash, Jr., and R. M. Berg; *Behavior of Plastics Under Repeated Stress,* B. J. Lazan and A. Yorgiadis; *Creep Testing of Plastics,* W. N. Findley; *Testing in Connection with the Development of Strong Plastics for Aircraft,* Henry Sang. In addition, there is an introduction by Robert Burns.

The second phase of the Symposium was devoted to a "Summary of Properties, Uses and Salient Features of Families of Plastics." Papers given at this section of the Symposium, including an introduction to the summary by Dr. Gordon M. Kline, are also reproduced in the book. These papers, and their authors, include: *Phenolic Materials—Molded and Laminated,* W. A. Evans; *Urea and Melamine Plastics,* Ladislav Boor; *Allyls,* Franklin Strain; *Vinyl Plastics—Rigid and Nonrigid,* H. L. Drukker; *Polystyrenes,* W. C. Goggin; *Cellulose Plastics,* W. E. Gloor. A conclusion to the summary by Dr. Kline also appears.

This latest symposium on plastics provides interesting and helpful information. Its value is enhanced by the inclusion of discussions which followed each paper presented. The current volume supplants the 1938 Symposium on Plastics which has been out of print for many months.

•

Proceedings of the Conference of Commissions of Inter-American Development. Published by the Inter-American Development Commission, Commerce Department Building, Washington 25, D. C. 6 x 9 in. 206 pp.

This is a published report on the First Conference of Commissions of Inter-American Development, held in New York City, May 9-18, 1944, under the auspices of the Inter-American Development Commission. It contains the final act of the Conference, a report on the plenary sessions, reproductions of all addresses and radio scripts, and, finally, resolutions and other material relating to the system of commissions of inter-American development.

•

Tires at War. Rubber Manufacturers Association, 444 Madison Ave., New York, N. Y. 11 x 8½ in. 8 pp.

The job done by the American tire manufacturing industry in meeting the near-impossible to maintain both military and essential civilian transportation is outlined in this statistical booklet. Figures on the production of airplane tires and truck and bus tires for the years of 1939 to 1944 are given, as well as statistics on passenger car tire production, camelback, crude and synthetic rubber, and cotton and rayon. All figures are given textually and by clearly-drawn graphs.

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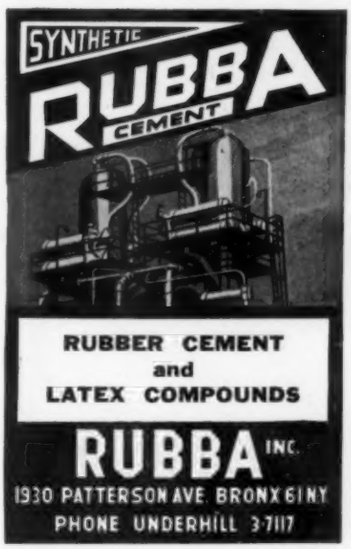

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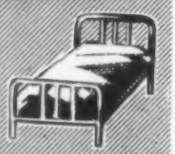

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Eastern States Representative—
BLACK ROCK MANUFACTURING CO. Bridgeport, Conn.

The Battle of Home. By Anthony Cekota. Published by the Macmillan Company of Canada, Ltd., Toronto, Ontario, Canada. 6 x 9 in. 374 pp.

The author of this book is one of the group of eighty Czechoslovaks who came to Canada in the summer of 1939 after escaping from their native city of Zlin when the Nazis took possession. All former employees of the Czechoslovak Bata Shoe Co., these men formed the nucleus of the Bata Shoe Co. of Canada and built a new life and a new industrial community in a remote part of Ontario in the town now called Batawa. The trials and tribulations of this group in leaving Europe, their arrival in Canada, and their efforts in organizing a new community form the first part of Mr. Cekota's story. The latter portion of the book presents the author's views of the problems of industry, today and tomorrow, and their possible solution. The book is divided into four parts in all: (1) Toward the New World; (2) The War; (3) The Struggle for Peace; and (4) A New Industrial Community.

•

Dictionary of Engineering and Machine Shop Terms. By A. H. Sandy. Revised by I. E. Berck. Published by Chemical Publishing Co., Inc., 26 Court St., Brooklyn 2, N. Y. 5½ x 8½ in. 153 pp. $2.75.

This book contains definitions of a number of the important terms and words used in the engineering field, gathered by the author during many years of experience, both in industry and as a lecturer. Clear of scientific inaccuracies, the author has taken a little license on occasion in the interest of clarity. Although of primary interest to beginners and students, the definitions hold interest to the experienced engineer as well. Originally published in England, the revised American edition includes many terms peculiar to the American engineering field.

BOOKLETS, CATALOGS, Etc.

Test Set Assemblies to Measure Insulation Resistance. Leeds & Northrup Co., 4907 Stenton Ave., Philadelphia 44, Penna. 7¾ x 10½ in. 8 pp.

This publication is of interest to manufacturers of electrical equipment who need to measure the insulation resistance of their products. It describes assemblies which are completely guarded from the effects of leakage currents. Two assemblies are presented, one for routine plant use and the other for laboratory measurements.

REMOVE THE NERVE WITH PHILBLACK A

(FOR FURTHER DETAILS, SEE AD ON PAGE 460)

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EXTRA LIGHT The Original Neoprene Type
A supreme quality product for the rubber trade. Extremely fine state of division. Improves storage stability and resistance to scorching. A curing agent unexcelled for increased modulus, greater resilience, reduced heat build-up, lower compression set and retention of tensile strength during heat service.

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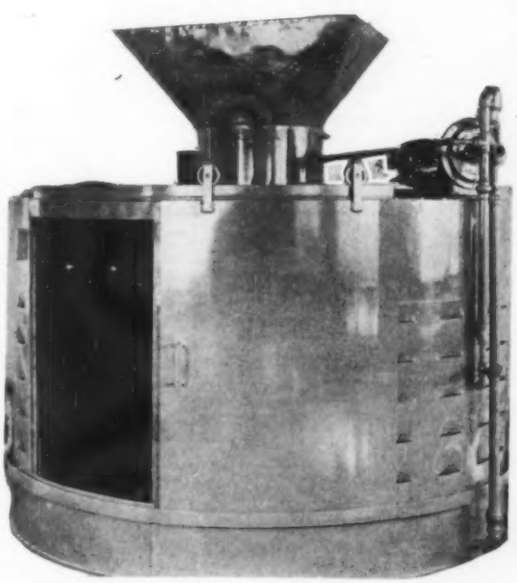

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155 JOHN ST. NEW YORK 7, N. Y.

Neville Resins and Plasticizers. Neville Co., Neville Island, Pittsburgh 25, Penna. 8½ x 11 in. 82 pp.

Specifications, properties, compatabilities and other characteristics of coumarone-indene resins, as well as other material in the resin and plasticizer field, are given in this new booklet. One section of the booklet gives information on applications of a number of these products, including uses in natural and synthetic rubber, flooring, adhesives, plastics, dental compounds, electric insulation, and protective coatings. Another section presents a preview of new and useful resins, plasticizing oils, solvents and pure chemicals, including diindene, hydrindylphenol, and several grades of Nevillacs. Elaborate indexing is provided for reference purposes.

•

Why Cellulose Plastics? Cellulose Products Dept., Hercules Powder Co., Wilmington 99, Delaware. 8 x 11 in. 4 pp.

Designed for both technical and non-technical readers, this colorful four-page folder illustrates the characteristics of a selection of end products made from cellulose acetate, ethyl cellulose, and cellulose nitrate. Among products illustrated are tough cloth-laminated Navy cargo containers, tubing which can be bent and flexed at —40°, transparent packages, and many different colored housings for radios, telephones and flashlights.

•

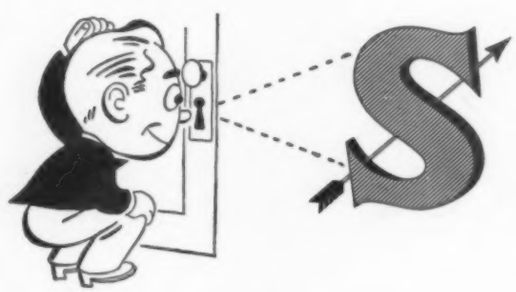
Canada and the United Nations. Gutta Percha & Rubber, Ltd., Toronto, Canada. 6 x 9 in. 24 pp.

Presented as a tribute to the United Nations, this attractive booklet gives general background material on our Allies, including the free governments and committees-in-exile. The factual material given includes data on area, population, principal industries, imports, rivers, large cities, and stabilized monetary units. Photographs of the heads of each country are included with illustrations of various national scenes and flags.

•

Rex Speed Prime Pumps. (Bulletin 447). Chain Belt Co., 1644 West Bruce St., Milwaukee 4, Wisc. 8½ x 11 in. 20 pp.

This catalog features the general purpose self-priming centrifugal pumps designed by the company to fit a wide range of pumping needs. Some nine pump types are listed and the advantages of each are described in detail. These pumps are made in sizes from 1¼ to 8 inches with capacities ranging from 3,000 to 125,000 gallons per hour. Descriptions of the uses and applications of each of the pumps are included.



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BACK COVER

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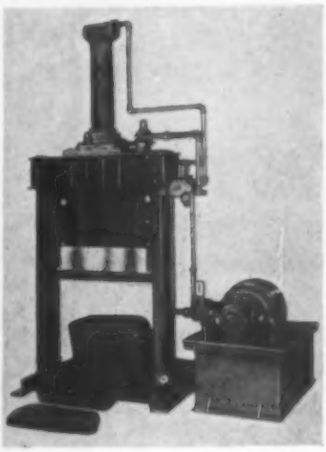

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REVIEWS (CONT'D)

Marbon S and S-1 Resins. Marbon Corporation, 1926 West 10th Ave., Gary, Indiana. 8½x11 in. 8 pp.

Some of the properties and applications of Marbon S and S-1, new synthetic resins that act as both heat plasticizers and organic fillers, when blended with GR-S, are discussed in this booklet. Electrical properties of typical compounds containing either resin are shown, as well as the percent water absorption of similar compounds. Charts showing data on tensile, elongation, permanent set and hardness of GR-S insulation stocks containing Marbon S and S-1 are included. Plasticizers, waxes and oils, commercial synthetic resins, and natural gums and resins which are compatible with the new synthetic resins are listed.

•

Vultac—Sharples Alkyl Phenol Sulfides. Sharples Chemicals, Inc., 123 So. Broad St., Philadelphia 9, Penna. 8½x11 in. 24 pp.

The chemical and physical properties of the Vultacs, the new series of vulcanizing agents for the butadiene copolymer synthetic rubbers, are summarized in this attractively printed booklet. Compounding data on typical GR-S and Buna N-type formulations is also included. Among such data are comparisons of one of the Vultacs (three types are available, differing in sulfur content to meet varying requirements in rubber compounding) with sulfur in both GR-S tread and inner tube compounds.

•

Some GR-S Sponge Compounds. (Booklet No. 5A). R. T. Vanderbilt Co., 230 Park Ave., New York, N. Y. 8½ x 11¼ in. 4 pp.

Formulas for producing three separate types of GR-S sponge rubber, one for general use, the second for dark-colored, non-tarnishing sponge, and the third for light-colored, non-tarnishing sponge, are given in this laboratory report. Data on the cured sponge slabs is also given. Cures were effected with sulfur, Selenac and Tuads, respectively. All three compounds discussed produce soft, low density, uniform sponge.

•

Goodyear on the Job. Goodyear Tire & Rubber Co., Akron, Ohio. 10½ x 13½ in. 24 pp.

The important role played by Goodyear's All-Weather Earth Mover, Sure Grip, Hard Rock Lug, and other earth mover tires in various military and essential civilian jobs is pictorially displayed in this attractive folder. The manufacture of these heavy-duty tires is also traced pictorially, from banding to curing. One section of the folder is devoted to care and maintenance of the heavy tires.

FOR LOW HEAT BUILD-UP, USE PHILBLACK A

(FOR FURTHER DETAILS, SEE AD ON PAGE 460)

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CLEAN UNIFORM

The Unique Asphalt of Many Uses

Now of Particular Interest to All Branches of the Rubber Industry

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MARBON "S" AND "S-1"

Synthetic Resins

Use With Synthetic Rubbers To:

- ★ **IMPROVE PROCESSING**
- ★ **IMPROVE HARDNESS AND STIFFNESS**
- ★ **IMPROVE TEAR AND ABRASION**
- ★ **IMPROVE SHRINKAGE**
- ★ **IMPROVE TUBING OF "PURE GUM"**

THESE RESINS HAVE EXCEPTIONALLY GOOD ELECTRICAL AND LOW WATER-ABSORPTION PROPERTIES

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Commercial Rubbermakers' Sulphur, Tire Brand, 99½% Pure

Refined Rubbermakers' Sulphur, Tube Brand, 100% Pure

Carbon Tetrachloride, **Carbon Bisulphide**

Caustic Soda, **Sulphur Chloride**

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MARKETS

Rubber – Crude, Reclaimed and Scrap – Cotton – Ducks – Tire Fabrics – Sheetings

NEW YORK, FEB. 10, 1945

Crude Rubber

MAJOR interest in crude rubber circles in the past month was centered on the series of meetings held in Washington among American, British and Dutch experts the week of January 22. These meetings are held in a semi-official atmosphere and none of the governments involved are committed in any way. The conferences are concerned solely with problems of supply and demand and discussions of any international world-wide agreement are only briefly touched upon.

Because of the uncertainties which exist in relation to the actual status of the plantations in the Far East it was not possible for the delegates at the latest meeting to arrive at any definite conclusions as to crude rubber supplies in the immediate post-war period. However, there was general agreement to the effect that it would take at least two full years to restore the plantations to proper productive capacity and that within three or four years after liberation production could rise to an annual figure of 1,500,000 long tons.

The conferees were also in agreement that world capacity of crude and synthetic would far exceed world demand within a few years after hostilities cease. Some hope was expressed that an expanding world economy will lead to a greater per capita consumption and that new uses for rubber will be developed, both factors combining to lessen the threat of overproduction. Although a price war between crude and synthetic is a possibility of the future, it was agreed that there was little likelihood of prices ever again dropping to as low as three or four cents.

Prices shown below are ceilings set by the Rubber Reserve Company:

	C	N-C
Plantations—		
Ribbed Smoked Sheets, 1X	22½	40
Thick Pale Latex Crepe, 1X	22½	40
Thin Pale Latex Crepe, 1X	22½	40
Thick Brown Crepe, 1X	21⅜	38⅞
Thin Brown Crepe, 1X	21⅜	38⅞
Thick Remilled Blankets, #1	21⅜	38⅞
Rolled Brown or Flat Bark	18	35½
Smoked Blankets, #1	21⅛	38⅜
Claro Brand 1XRSS	22½	40
Sole Crepe Trimmings	22	39½
Sole Crepe	22½	40
Wild—		
Uncut Fines, Crude	15	29
Cut Fines, Crude	15½	29¾
Cut Fines, Washed & Dried	22½	40
Upriver Coarse, Crude	12⅜	26⅛
Upriver Coarse, Washed & Dried	20¼	37¾
Caucho Ball, Crude	11⅝	24¾
Caucho Ball, Washed & Dried	19½	37
Guayule—		
Carload Lots	17½	31
Less than Carload Lots	18	31½
Balata—		
Surinam Sheet	42½	42½
Manaos Block	38¾	38¾
Colombian Block	38¾	38¾
Peruvian Prime	38¾	38¾
Chicken Wire	23¼	23¼
Latex—		
Normal, Tank Car Lots	26	43½
Creamed, Tank Car Lots	26¾	44¼
Centrifuged, Tank Car Lots	27¼	45¼
Heat-Concentrated, Carload Drums	29½	47

C for Civilian Use; N-C for Non-Civilian Use.

Scrap Rubber

A definitely stronger tone in recent weeks has lifted prices of certain scrap, particularly tires. At last reports, beadless tires were being bought for delivery to Akron at $24.00 per ton and at $22.00 per ton for delivery in the east. Supplies are still fairly plentiful and greater activity is reported in regular trade channels now that the Rubber Reserve Co. is slowly withdrawing as a major factor in the scrap field. According to a report issued by Jesse Jones, just prior to his departure as head of the Reconstruction Finance Corp., Rubber Reserve purchased a little more than 1,000,000 short tons of scrap rubber in the period from June, 1942, to January 1, 1944, during which it was the sole buyer and seller of scrap, and has disposed of some 920,000 tons to date. Prices shown below are ceilings on typical grades of scrap:

(Prices to Consumers, Delivered Akron)

Mixed passenger tires	ton	$20.00
Beadless truck tires	ton	26.00
Mixed truck tires	ton	20.00
Beadless passenger tires	ton	26.00
No. 1 passenger peelings	ton	52.25
No. 1 truck peelings	ton	52.25
No. 2 passenger tubes	lb.	.07¼
Red passenger tubes	lb.	.07½
Black passenger tubes	lb.	.06¾
Mixed passenger tubes	lb.	.06½
No. 2 truck tubes	lb.	.07½
Red truck tubes	lb.	.07¼
Black truck tubes	lb.	.06½
Buffings	ton	35.00
Bicycle tires	ton	15.00
Air bags and water bags	ton	15.00
Boots and shoes	ton	33.00

Tire Fabrics

The situation in the tire fabric field remains unchanged, with practically no demand for such fabrics. Consequently, prices are nominal and in many quarters are not even being quoted. The prices shown below are those which were in force on or about January 15, 1942.

(Prices Net at the Mill)

Peeler, carded, 23/5/3	lb.	.43½ @	.44
Peeler, carded, 23/4/3	lb.	.44½ @	.45
Peeler, carded, 15/3/3	lb.	.41½ @	.42
Peeler, carded, 15/4/2	lb.	.41½ @	.42
Peeler, carded, 13/3/3	lb.	.40½ @	.41
CHAFERS			
Carded, American, 1 1/16"	lb.	.43½ @	.44
Carded, American, 1"	lb.	.39½ @	.48

Sheetings

48x40	36 in.	5.50	lb.	—	@ 8.272
40x40	36 in.	6.15	lb.	—	@ 7.398
40x36	36 in.	6.50	lb.	—	@ 7.000
48x48	40 in.	2.50	lb.	—	@17.200
48x48	40 in.	2.85	lb.	—	@15.087
56x60	40 in.	3.60	lb.	—	@12.638
48x44	40 in.	3.75	lb.	—	@11.733

Note: Prices shown above are ceiling prices set by order of the O.P.A.

Cotton

The price of middling uplands on the Cotton Exchange has swung in the range of 61 points since our last report, high being 22.56 on January 16 and low 21.95 on January 24. The average price for middling uplands on the Exchange for the month of January was 22.36, based on 26 trading days. The swift advance of the Russian armies through German-held territories in mid-January precipitated nervous commission house and Southern liquidation, with the result that the price dropped steadily until it touched the low mark of 21.95 on January 24. Political developments on the home front turned the tide shortly thereafter and prices began to move up again slowly. Renewed mill and commission house purchases were reported motivated by the activities of the backers of the amendment offered by Senator Thomas to revise the farm price parity formula to include labor costs. The objective of the sponsors of the bill is reported to be 30-cent cotton and $1.83 wheat. The Service Bureau of the New York Cotton Exchange estimated January consumption of all cotton at 855,000 bales, an increase of 94,000 bales over December. Quotations for middling uplands on the Exchange follow:

	Jan. 15	February 10		
	Close	High	Low	Close
March	22.12	21.86	21.83	21.86
July	21.69	21.30	21.25	21.27
October	21.06	20.65	20.56	20.58

Reclaimed Rubber

Demand for reclaim continues at the same high level established in recent months and reclaimers anticipate no falling off of such demand for the next several months. The carbon black situation, which continues tight and will probably remain so until new production facilities come into bearing, is partially responsible for this demand. Some importance is being attached in reclaim circles to the new process recently patented by Goodrich which is designed to improve the quality of reclaimed rubber. It is a depigmentizing method which uses bentonite after the scrap has been dissolved in a standard solvent for the purpose of eliminating carbon black and other pigments. The recent freight embargos in the east have interrupted shipments somewhat, but that condition is being righted. Prices shown below are ceilings on typical grades of reclaim:

Shoe			
Unwashed	lb.	.07½ @	.07¾
Tube			
Black Tube	lb.	.11¾ @	.12
Red Tube	lb.	.12½ @	.12¾
Tires			
Black (acid process)	lb.	.08 @	.08¼
Black, selected tires	lb.	.07 @	.07¼
Truck, Heavy Gravity	lb.	.09 @	.09¼
Miscellaneous			
Mechanical blends	lb.	.05 @	.06
White	lb.	.13½ @	.13¾

Ducks

Enameling (single filling)	lb.	— @	.44¼
Belting and Hose	lb.	— @	.39
Single filling, A grade	lb.	— @	.19¾
Double filling, A grade	lb.	— @	.20¾

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Wm. S. GRAY & CO. DISTRIBUTORS NEW YORK CITY

CHEMICAL MARKETS

New York, Feb. 10, 1945
All Prices F.O.B. Works

ACCELERATORS

Organic			
A-1 (Thiocarbanilid)	lb.	.28	.33
A-10	lb.	.36	.42
A-19	lb.	.52	.58
A-32	lb.	.60	.70
A-77	lb.	.42	.55
A-100	lb.	.42	.55
Aldehyde ammonia, crystals	lb.	.65	.70
Altax	lb.	.39	.41
Beutene	lb.	.59	.64
B-J-F	lb.	.34	.39
Butasan	lb.	—	1.10
Butyl Zimate	lb.	—	1.10
Captax	lb.	.34	.36
Crylene	lb.	.40	.47
Di-Ortho-Tolyguanidine	lb.	.44	.46
Diphenylguanidine	lb.	.35	.41
El-Sixty	lb.	.36	.43
Ethasan	lb.	—	1.10
Ethyl Tuads	lb.	—	1.25
Ethyl Zimate	lb.	—	1.10
Ethylidine aniline	lb.	.42	.43
Formaldehyde aniline	lb.	.31	—
Guantal	lb.	.39	.48
Hepteen	lb.	.34	.39
Hexamethylenetetramine	lb.	.33	—
Lead Oleate, No. 999	lb.	.13	—
Witco	lb.	.15	—
Ledate	lb.	—	1.20
Methasan	lb.	—	1.20
Methyl Tuads	lb.	—	1.25
Methyl Zimate	lb.	—	1.20
Monex	lb.	—	1.25
Pentex	lb.	.74	.84
Phenex	lb.	.49	.54
Pip-Pip	lb.	—	1.63
R & H 50-D	lb.	.42	.43
R-2 Crystals	lb.	—	1.55
Rotax	lb.	.44	.46
Safex	lb.	1.15	1.25
Santocure	lb.	.60	.67
Selenac	lb.	—	1.60
SPDX-G	lb.	.53	.58
Super-Sulfur No. 2	lb.	.13	.15
Thiocarbanilid, drums	lb.	.28	.33
Thiofide	lb.	.39	.46
Thiotax	lb.	.34	.41
Thiurad	lb.	—	1.25
Trimene	lb.	.54	.64
base	lb.	1.03	1.18
Triphenylguanidine	lb.	.45	—
Ulto	lb.	.99	1.04
Ureka	lb.	.50	.57
Blend B	lb.	.50	.57
Blend C	lb.	.48	.55
Vulcanex	lb.	.42	.43
Vulcanol	lb.	.85	—
Inorganic			
Litharge, domestic	lb.	.07	.07½
Magnesia, calcined, heavy	lb.	.04	—

COLORS

Blues [b]			
Prussian	lb.	.36	—
Ultramarine	lb.	.17	.27
Browns [b]			
Mapico	lb.	.1135	—
Umber, Turkey	lb.	.04¼	—
Greens [b]			
Chrome	lb.	—	.25
Guignet's Green	lb.	.70	—
Reds			
Antimony crimson, 15/17	lb.	—	—
Indian	lb.	.08¼	—
Domestic (Maroon)	lb.	.11	—
Mapico	lb.	.096	—
Red oxide, pure	lb.	.10	.12
Rub-Er-Red	lb.	.09¼	—
Whites [b]			
Cryptone No. 19	lb.	.0560	.0585
Cryptone CB No. 21	lb.	.0560	.0585
Cryptone ZS-800	lb.	.0825	.0850
Lithopone:			
Albalith	lb.	.04¼	.04½
Astrolith	lb.	.04¼	.04½
Azolith	lb.	.04¼	.04½
Ray-cal	lb.	.05½	.05¾
Rayox	lb.	.14½	.15¼
Titanox A	lb.	.14½	.14¾
Titanox B	lb.	.05¾	.06
Titanox C	lb.	.05½	.05¾
Zinc Oxide—American Process [b]			
American Axo:			
ZZZ (lead free)	lb.	.07¼	.07½
Anaconda, lead free	lb.	.07¼	.07½
Horsehead Lead Free Brand:			
Special—3	lb.	.07¼	.07½
XX Red—4	lb.	.07¼	.07½
XX Red—72	lb.	.07¼	.07½
XX Red—103	lb.	.07¼	.07½
Kadox, black label—15	lb.	.07¼	.07½
Red label—17	lb.	.07¼	.07½
St. Joe, black label	lb.	.07¼	.07½
green label	lb.	.07¼	.07½
red label	lb	.07¼	.07½
U. S. P.—7, bbls.	lb.	.10½	.10¾
Zinc Oxide—French Process: [b]			
Florence White Seal—7 bbl.	lb.	.09½	.09¾
Green seal—8	lb.	.09	.09¼
Red seal—9	lb.	.08½	.08¾
Yellows [b]			
Cadmolith	lb.	.55	.60
Chrome	lb.	—	.50
Mapico	lb.	.071	—

BLACKS
(In bags, carload lots)

Arrow Compact		.0355	—
Atlantic		.0355	—
Certified		.0355	—
Certified Spheron		.0355	—
Continental		.0355	—
Disperso		.0355	—
Dixiedensed		.0355	—
Dixiedensed 66		.0355	—
Excello		.0355	—
Furnex		.03½	.06
Furnex Beads		.03½	.06
Gastex		.03½	.06
Kosmobile		.0355	—
Kosmobile 66		.0355	—
Kosmos-Dixie 20	lb.	.03½	.06
Micronex (Amarillo)		.0355	—
Micronex Beads (Amarillo)		.0355	—
Pelletex		.03½	.06
P-33		.04	.06½
Philblack A	lb.	.05	—
Shell Carbon (Del. Midwest)		.0240	—
Sterling		.035	—
Supreme		.0355	—
Thermax		.0225	.05
Wyex		.0355	—

COMPOUNDING MATERIALS

Aluminum Flake	ton	18.00	24.50
99½%-300	ton	—	16.50
86-90%-300	ton	—	13.50
Asbestine	ton	16.50	20.00
Atomite	ton	—	27.50
Barium carbonate (98-100%)	ton	47.00	49.00
Barytes	ton	25.35	36.00
Bentonite	ton	11.00	16.00
Blanc fixe, dry	ton	60.00	67.50
Calcene	ton	37.50	43.00
Catalpo (fact)	lb.	.02	—
Clay, Aerfloted, Suprex	ton	11.00	23.50
Aerfloted Paragon	ton	10.00	22.50
Champion	ton	—	11.00
Crown	ton	—	11.00
Dixie	ton	11.00	23.50
Kaolloid	ton	—	9.00
Langford	ton	—	8.50
Magnolia	ton	—	10.00
McNamee	ton	10.00	22.50
Par	ton	—	11.00
Witco	ton	10.00	—
Kalite No. 1	ton	26.00	52.00
Kalvan	ton	100.00	126.00
Keystone white	ton	—	14.00
Magnesium carbonate	lb.	.06¾	—
Mineralite	ton	—	30.00
Pyrax A	ton	—	7.90
Rottenstone (powd. Dom.)	ton	25.50	37.50
Rubberol	lb.	—	.17½
Silene EF (calcium silicate)	lb.	.055	.06
Silical	ton	65.00	85.00
Snowflake white	ton	—	16.00
Tale, domestic	ton	17.00	25.00
Whiting, commercial	ton	16.00	26.00
Witco	ton	6.00	—
Witcal	ton	—	100.00
Witcarb R-12	ton	—	40.00
Wood Flour (100 mesh)	ton	30.00	32.00

MINERAL RUBBER

285°-300° Mineral Rubber	ton	25.00	27.00
Black Diamond	ton	25.00	—
Dielex	lb.	—	.06
Hard Hydrocarbon	ton	25.00	27.00
MilliMar	lb.	—	.05½

MISCELLANEOUS

Aromatics—Rodo #0	lb.	4.00	4.50
Rodo #10	lb.	5.00	5.50
Curodex 19	lb.	2.75	—
Curodex 188	lb.	3.50	—
Curodex 198	lb.	4.50	—
Para-Dors	lb.	4.50	—
Areskleno No. 375	lb.	.35	.50
Darvan (dispersing agent)	lb.	.30	.39
Santomerse S	lb.	.11	.25
Sponge Paste	lb.	—	.18
Sunproof	lb.	.22¼	.27¾
Tonox	lb.	.50	.59
Ty-Ply	gal.	6.75	8.75
Unicel (blowing agent)	lb.	.50	—

SOFTENERS

Acids			
Acetic, 28%, bbls.	100 lb.	3.38	3.63
Nitric, 36 degrees	cwt.	5.00	—
Acids, Fatty			
Laurex	lb.	.14¾	.17¼
SL-20	lb.	.11	.13
Stearex Beads	lb.	.10	.11
Stearite	lb.	.10	—
Alkalies			
Caustic Soda, 76%	cwt.	2.70	5.7
Soda Ash, 58%	cwt.	1.15	2.98
Oils			
Degras, bbls.	lb.	.10	.12
Para-Flux	gal.	.17	.18
Para-Lube	lb.	.046	.048
Petrolatum, amber [b]	lb.	.03¾	—
Pigmentaroil, tank cars	gal.	.20½	—
in drums	gal.	.26½	.27½
Pine, tanks	gal.	.55	—
Rosin Oil, cmpd.	gal.	.40	—
Rubberol	lb.	.13½	.14
Rubtack	lb.	.10	—
Seedine, c.l.	lb.	.07¼	—
Witco Palm Oil	lb.	—	—
Witco Softener No. 20	gal.	.20	—
Woburn No. 8, c.l.	lb.	.06	—
Resins and Pitches			
Pitch, Burgundy	lb.	.06	—
coal tar	ton	19.00	22.00
hardwood	ton	16.00	22.50
pine, 200 lb. gr. wt.	bbl.	—	4.50
Pigmentar, tank cars	gal.	.20½	—
in drums	gal.	.26½	.27½
Retort Pine Tar, drums	gal.	.26½	.27½
Solvents			
Acetone, pure [a]	lb.	.07	—
Benzene, 90%, tank car	gal.	.14	—
Beta-Trichlorethane	gal.	—	.20
Bondogen	lb.	.98	1.25
Carbon, bisulfide	lb.	05	.08½
Carbon tetrachloride	gal.	.83	1.27
Dichlorethylene	lb.	—	—
Dipentene, cml., drums	gal.	.48	.50
Ethylene dichloride	lb.	.07½	.08¼
Plastogen	lb.	.07¾	.12
Reogen (drums)	lb.	.11½	.15
Rub-Sol	gal.	.09½	—
Trichlorethylene	lb.	.08	.09¼
Turpentine, spirits	lb.	.78½	—
dest. dist., drums	gal.	.50	.55
Waxes			
Antisol	lb.	.22½	.23½
Beeswax, white [b]	lb.	.58	—
Carnauba, yellow [b]	lb.	.83¼	—
Ceresin, white, dom.	lb.	.13½	.15
Montan, crude	lb.	—	—
Paraffin [a]			
Yellow crude scale, 124/126	lb.	.04¼	—
Refined, 123/125	lb.	.05¼	—

ANTI-OXIDANTS

Agerite Alba	lb.	1.95	2.05
Gel	lb.	.52	.54
Hipar	lb.	.61	.63
Powder	lb.	.40	.42
Resin	lb.	.43	.45
Resin D	lb.	.40	.42
White	lb.	1.23	1.33
Albasan	lb.	.69	.74
Antox	lb.	.54	.56
B-L-E	lb.	.40	.49
Flectol H	lb.	.40	.47
Neozone A, C, D, E	lb.	.40	.63
Oxynone	lb.	.77	.90
Retardex	lb.	.44½	.47½
Santoflex B	lb.	.40	.47
Santoflex BX	lb.	.54	.61
Santovar O	lb.	1.15	1.40
S.C.R.	lb.	.32	.34
Stabilite	lb.	.48	.50
Stabilite Alba	lb.	.69	.74
VGB	lb.	.43	.52

EXTENDERS

Naftolen R-100	lb.	.10	.12

LUBRICANTS—MOLD & RUBBER SURFACE

Aresklene	lb.	.35	.50
Cocoa Soapstock	lb.	.06	.08
Colite	gal.	.90	1.15
Dipex	lb.	.06	.08
Glycerized Liquid Lubricant	gal.	—	1.35
Lubrex	lb.	.25	.30
Mineralite	ton	—	30.00
Sericite	ton	65.00	75.00
Soap Tree Bark, cut, sifted	lb.	.06	.08

FACTICE OR RUBBER SUBSTITUTES

Amberex	lb.	.25	—
Amberex Type B	lb.	.18¾	—
Black	lb.	.08½	.13
White	lb.	.09	.15
Brown	lb.	.10	.14
Neophax A	lb.	.16½	—

VULCANIZING INGREDIENTS

Dispersed Sulfur No. 2	lb.	.08	.12
Sulfur Chloride, yellow (drs.)	lb.	.03	.08
Sulfur, rubber makers			
Refined (bags)	cwt.	2.55	—
Commercial (bags)	cwt.	2.20	—
Telloy	lb.	1.75	—
Vandex	lb.	1.75	—
Vultac No. 1	lb.	.38	.43
Vultac No. 2	lb.	.38	.43
Vultac No. 3	lb.	.42	.49

[a] Price Ceilings.
[b] Price Suggestions or Agreements.

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The Market Place

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MONSANTO CHEMICAL CO.
Rubber Service Dept.
1012 Second National Bldg., Akron 8, Ohio

AERO BRAND
RUBBER CHEMICALS
DPG—DOTG—Accelerator 49
Rubber Sulphur
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Tar and Chemical Div.
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Rubber Service Dept.
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Plasticizers — Aromatics
Dispersions — Blacks
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A neutral gum for synthetic rubber compounding. *Laboratory test data, samples and prices on request.*
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Allied Chemical & Dye Corp.
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DU PONT RUBBER COLORS
DU PONT ACCELERATORS
DU PONT ANTI-OXIDANTS
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RUBBER CHEMICALS DIVISION
WILMINGTON, DELAWARE

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SHELL DUTREX 6—Plasticizer and Extender for GR-S
Chemically and Physically Controlled
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"CONCORD" Wet Ground Mica
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"Orvus" enables articles to leave molds readily; molds clean easily. Effective in hardest water. Also acts as thorough cleanser for molded and extruded rubber goods.
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Plasticizer—Sulphur Reactive
High Loading Tolerated
Great Elongation Produced
Cool Processing Stocks
Advance Solvents & Chem. Corp.
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STEAREX BEADS
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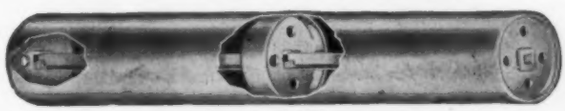

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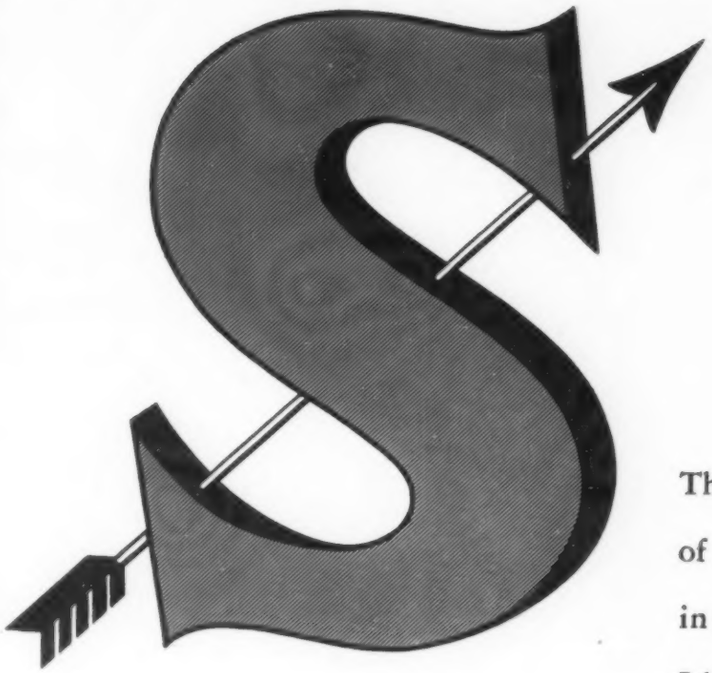

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